Paper TRADE JOURNAL
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January Set Records Census Bureau Says

Washington — Production of paper and paperboard during January 1947, at 1,762,929 tons, established a new high in the current monthly series according to preliminary figures released by the Bureau of the Census. This figure was 185,178 tons above December 1946, 248,504 tons over January 1946, and 11,782 tons above the previous high in October 1946. The increase was general throughout the grade structure, the most substantial gains occurring in the coarse paper and container board segments.

Pulpwood receipts during the month, at 1,709,491 cords, were 271,411 cords above December 1946, and 355,531 cords over January 1946. This high volume of receipts was sufficient to meet consumption requirements and to increase mill inventories by 43,294 cords. The greatest increases over December were recorded in the northeastern and Lake state regions. The inventory holdings of the southern mills, never substantial, were much more favorable than on January 31, 1946, when the mills in this area had only 99,016 cords in stock. January consumption of pulpwood amounted to 1,666,200 cords.

Although receipts of fibrous materials, other than pulpwood as a whole, dropped sharply during the month, the receipts of waste paper, rags and flax were slightly higher. However, the new supply of waste paper was not sufficient to meet requirements, and withdrawals from the ample inventories of these materials were necessary.

December pulp production, at 997,818 tons, also established a new record in this monthly statistical series. This figure is 114,354 tons above December 1946, 210,819 tons over January 1946, and 25,586 tons above the previous high of October 1946. The greatest tonnage increase occurred in sulphate pulp and reflects the improved pulpwood situation in the South.

Consumption of wood pulp in paper and paperboard manufacture, at 1,112,862 tons, was 117,212 tons above December 1946, and 24,267 tons above the former high in October 1946. Here again, sulphate pulp led by a substantial tonnage. Inventories of pulp at paper and paperboard mills continued to decline in January, although inventories of pulp at pulp mills were somewhat higher than on December 31, 1946. Of the 20,554 ton reduction of inventories at consuming mills, 11,765 tons were of European origin.

Waste Trade is Told Of Improved Packaging Trend

APPA Paper Statistics Compiled In One Book

NEW YORK—The Statistics of Paper, a new booklet compiled by the American Paper and Pulp Association is planned to answer a long felt need for an all-inclusive statistical reference book on the paper industry. The material has been reviewed by the member associations and includes data available in the Association's records with considerable original research undertaken by APPA's Division for Economic Research.

Statistics on the paper industry which were available since 1810 are included along with more detailed studies following the growth and expansion of the industry up through 1946.

This comprehensive book covers industry-wide figures on production, receipts, consumption, inventories, imports and exports of pulpwood, wood pulp, waste fibrous materials, paper, paperboard and paper products as well as a section on financial data of the paper industry since 1939.

The book is being distributed free to all APPA members, and is available to non-members of the Association for a fee of $5.

Mohawk Valley Mills Meet Capacity Schedules

COHOES, N. Y. — Reports from various sections of the Mohawk Valley indicate that the majority of paper mills are maintaining near capacity schedules with orders far ahead in many instances. Among the mills enlarging forces in recent weeks are the Imperial Paper and Color Company, Union Bag & Paper Company, Glens Falls, Embossing Company, Albany, and others. New plant additions under way in numerous mills will also allow increased production when completed. Construction work is proceeding rapidly on a new addition to the Warrensburg Pulp & Paper Company which will be used for housing another papermaking machine.

CHICAGO — The annual meeting of the Waste Paper Institute convened on March 18 with A. W. Arenander, Jr., purchasing agent of the West Virginia Pulp and Paper Company, and Ira C. Keller, head of the Container Corporation of America, as the first speakers. Mr. Keller stressed the fact that demand for higher grades of paper will continue as long as the merchandising trend is toward improving printing of packages—and he indicated that this trend was most pronounced at the present time. Mr. Arenander outlined the foreign pulp situation and stated that in his opinion European pulp would be scarce for years. He spoke of the efforts of the paper trade to keep prices down, to refrain from pricing itself out of the market, and urged his audience of waste material dealers and guests not to "push old paper prices too high."

Harold Shilling of Chicago, president of the Waste Paper Institute, utilized the time allotted to him to drive home to waste paper dealers the importance of the product they buy and sell to the over-all future of America and its domestic economy. He pointed out how waste paper saves an important natural resource—timber—and stressed the need for enthusiastically encouraging the continued usage of waste paper. He also urged members of the Institute to clean their own house, to get "quality-minded" and to take these steps in "order to maintain competitive positions with pulp." The speaker said that if quality improved, internal situations were worked out and the importance of waste paper properly stressed, the trade could and would go far forward in the next few years.

The Cotton Rag Council, meeting apart from the Waste Paper Institute, heard an imposing array of speakers whose names are well known to the paper trade itself. Problems in the manufacture of fine writing paper were discussed by such well known authorities as Morris L. Dobrow, executive secretary of the Writing Paper Manufacturers Association; Dr. Harry F. Lewis, research associate of the Institute of Paper Chemistry; Carlton B. Overton, president of Castle & Overton, Inc.; E. D. Szold, executive

(Continued on page 26)

Sees Lower Prices In Imports from Europe

New York — Warren B. Bullock, manager of the Import Committee of the American Paper Industry, from his analysis of imports in January finds a marked rise in tonnage of various grades of paper imported from Europe, some at low values. Groundwood paper from Finland, totaling 200 tons, was valued at $69. per ton, and similar paper from Norway at $66, as compared with a price for Canadian paper of $97.50 and $92. for Newfoundland. Strawboard from Holland totaled 300 tons, at a value of $74., and glassine from Finland was priced at 9.8 cents per pound for 13 tons. Nearly 1,000 tons of solid wood pulpboard was imported from Finland, at a value of $72. per ton. The Netherlands shipped 100 tons of a high priced paperboard, valued at $175. per ton. Seattle received a shipment of 28 tons of tissue paper valued at 11.7 cents per pound.

Mr. Bullock also points out that the annual report of the Export Import Bank plans an expansion of its operations by granting Government credit to facilitate import as well as export trade. These credits may be extended as follows:

1. To foreign organizations.
2. To United States citizens to finance production abroad by American-owned corporations.
3. To United States citizens to make payments for imports.

The report states that useful and economically desirable imports should be stimulated by all appropriate means.

Meanwhile, the Bank has authorized a new loan to Finland of $2,500,000 to finance sales promotion for Finnish products in the United States. This is in addition to an earlier loan of $20 million earmarked for development of the Finnish wood using industries, including pulp and paper, for increased export trade.

Business As Usual As Waste Dealers Meet

Chicago — The highly active scrap and waste paper market was reflected in the record breaking attendance of more than a thousand waste dealers who swarmed into Chicago and the Hotel Sherman last week for the 34th annual meeting of the National Association of Waste Material Dealers, Inc. Buyers from all parts of the country were on hand, including a large number of waste paper dealers who had a most important part in the three day program. The waste paper and cotton rag situation was covered by special institutes held on Tuesday and Wednesday of the week while all meetings gave the entire trade a splendid opportunity to review the current situation.

Even while the program was going on, there was a lot of business activity in evidence as dealers with stocks to sell met up with those who have likewise experienced the strong movement in waste paper during the past few weeks.

Thilmany Wage Hike Given 1,125 Employees

Kaukauna, Wis. — Thilmany Pulp and Paper Company has granted a 5-cent hourly wage increase to all hourly paid employes, effective March 9, according to L. C. Smith, director of industrial relations. With the increase, the male base rate now is $1 per hour and the female rate is 89 cents per hour.

About 1,125 employes affiliated with the International Brotherhood of Papermakers, Local 20, and the International Brotherhood of Pulp, Sulphite and Paper Mill workers, Local 147, are affected. Under the agreement providing for the wage increase, the labor contract expiring May 31, 1947, has been extended until August 1, 1947.

Continental Can Completes Hummel-Ross Transfer

New York—Hans A. Eggerss, president of Continental Can Company, reported late last week that the assets of the Hummel-Ross Fibre Corporation, of Hopewell, Va., have been formally transferred to Continental in exchange for 293,780 shares of Continental common stock. The transfer was completed pursuant to an agreement approved at a meeting of the stockholders of Hummel-Ross in Hopewell, February 4, following prior approval by the board of directors on December 6, 1946. Mr. Eggerss said that the newly acquired mill will be operated as the Hummel-Ross division of the Continental Can Company.

Quebec Bill Would Keep Pulpwood From Ontario

Toronto—Introduction of a bill before the Quebec Legislature which would prohibit export of pulpwood to Ontario is being watched with interest by the Ontario Legislature at Queens Park, here. It is estimated that approximately 400,000 cords are now brought in annually from the neighboring province. Most of this wood finds its way into the United States as newsprint.

The preamble of the bill sets out the reasons "to insure the stability of our forest and paper industry" and "it is appropriate to adopt such measures as are necessary for the preservation, renewal and rational exploitation of our forests and to prevent the dangers of over-production and over-capitalization."

The "meat" of the bill is "any wood cut on Crown lands under a cutting license issued in conformity with the Lands and Forests Act (Revised Statues 1941, Chapter 93), must be wholly worked within the province."

United Paperboard To Laminate Foil

New York — P. M. Loddengaard, vice-president, United Paperboard Company, has disclosed the formation of a foil laminating division at the company's Victory Mills, N. Y., plant to operate under the name of United Laminating Corporation. Foil will be laminated to all types of board as well as paper, and protective and decorative coatings will also be applied to board and paper. Some of this material will be available for the converting trade and the balance will be converted in United's own plants at Victory Mills, Syracuse, Cohoes, and Springfield, Ohio. This was pointed out as in line with the planned development of the company to convert its entire tonnage of board.

For the last year and a half, considerable progress has been made until now practically the entire production of the Thomson, N. Y., mill is converted at Victory Mills, while a large percentage of the Urbana, Ohio, mill production is being converted at Springfield. Furthermore, the company is calling on the Lockport, N. Y., plant for additional board for Victory Mills and Cohoes as well as the Syracuse operation.

A few years ago this company made very little but chipboard and suit box materials but is now making millions of high-grade folding cartons every month. There is every indication that this growth will continue.

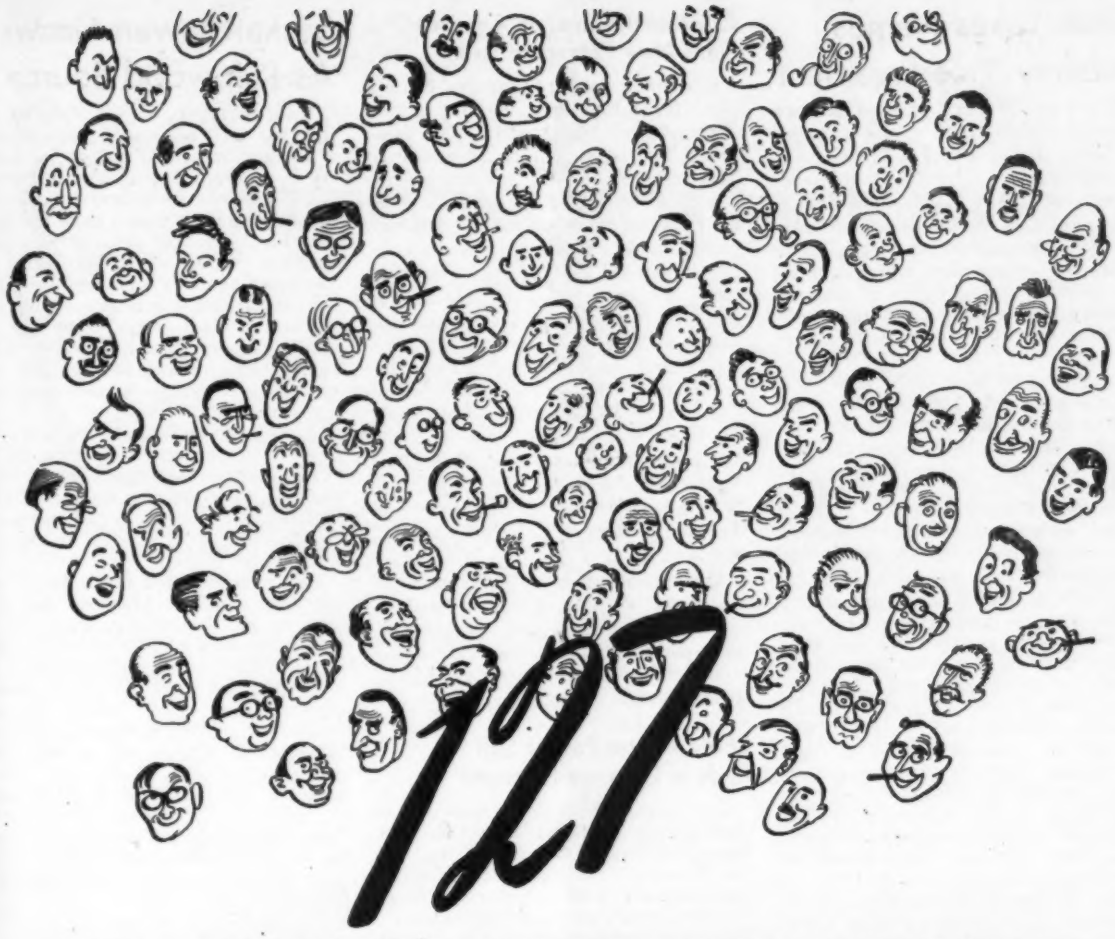
A. S. M. E. Picks Atlantic City For Annual Convention

New York—The 1947 annual meeting of the American Society of Mechanical Engineers will be held in Atlantic City, N. J., December 1-5. This will be only the third time in the Society's 68-year history that it has held the largest of its national gatherings outside of New York City. The eleventh annual meeting, in 1890, was held in Richmond, Va., and the sixtieth, in 1939, was held in Philadelphia.

A desire to avoid the hotel congestion in New York which is expected to result from meetings of the United Nations was given as a chief reason for the change. The decision was reached following a vote of members.

A. C. C. L. to Meet on Coast

Los Angeles — The Western Division of the American Council of Commercial Laboratories will be host to the Council at its semi-annual meeting to be held at the Hotel Ambassador, on May 26 and 27. Roger W. Truesdail, of Truesdail Laboratories, Inc., Los Angeles, who is president of the Western Division will welcome the Council members to an important meeting of the group.



MILL SUPERINTENDENTS USING ORR-CHEMS

ORR-CHEM felts—a laboratory study a year ago, released to the mills scarcely six months ago—already have won the confidence of 127 mills and carry their stamp of approval.

But suppose we let the superintendents do the "boasting".

BOXBOARD—*"Treated felts going fine. Production up 10% since starting use of them."*

ROOFING—*"We have tried out the chemically-treated felt . . . request all felts shipped be chemically-treated . . . request you carry five or six in stock for us at all times."*

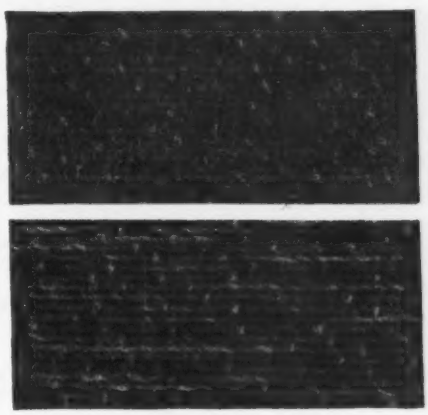
TISSUE—*"No. 14391 operated 227¾ hours or ten days, at a cost of 87¢ per ton—average cost over past year $1.00. Felt started good, operated well. Water removal excellent. Just sent order for two more."*

SULPHITE PULP WET MACHINE—*"Have used treated felt on No. 14075 and it made 500,000 pounds more pulp (wet weight) than usual."*

STRAWBOARD—*"Felt very open. Machine up to full speed as soon as sheet reached the dryer. Never had a break—something for this mill. Formation and tests okay."*

STRAWBOARD—*"Just completed 10⅔ days' run on No. 12367, which is 5 days more than average."*

If already acquainted with ORR-CHEMS, accept our appreciation of your confidence. If you haven't tried an ORR-CHEM, you will be agreeably surprised when you do so. Your try-out order is awaited.



Bottom felts, both Orr, and identical except that one is an ORR-CHEM (treated chemically) and the other was untreated. Ran consecutively on same machine under identical conditions and for the same length of time. The ORR-CHEM is still in good condition; the untreated Orr is worn out.

THE ORR FELT & BLANKET CO.
PIQUA, OHIO

ORR-CHEM

Great Lakes Names Delahey Vice President

TORONTO—Wallace Acheson Delahey, recently made executive vice-president of Great Lakes Paper Co., brings to the company a wealth of experience in woods operations. He comes to the new job from the Ontario Forest Industries Association, an organization embracing companies which control the bulk of cutting rights in Ontario. Delahey was manager of that body since its formation three years ago or more.

Delahey was born on a farm near Winnipeg in 1890, but got most of his early schooling in Pembroke, Ont. He was graduated in 1914 from the Faculty of Forestry of the University of Toronto and immediately enlisted for overseas service in the war of that period with the Canadian Engineers, as a private, and came back in 1919 as a captain with an M.C.

In 1920 he joined the forestry branch of the Ontario Department of Lands and Forests on survey work and later opened the first district offices of the branch at Pembroke and Sudbury. From 1926 to 1939 Delahey was with Canadian International Paper Co. For the first two years he was forest engineer of that company's Gatineau operations; in 1929 assistant to Vice-President Brig. J. B. White, who had charge of all Canadian logging operations; from 1930 to 1938 manager of the Gatineau division and in 1939 assistant to general woods manager in Montreal. Then followed four years as manager of the Transcontinental Timber Co. on pulpwood operations directed from Toronto and Hearst, with a short period on loan to Ottawa as assistant timber controller in charge of pulpwood operations.

Delahey is a member of the Forest Advisory Committee of the National Research Council, of the Quebec Association of Forest Engineers, of the Canadian Society of Forest Engineers of which he was president in 1936-37, and the Woodlands Section of the Canadian Pulp and Paper Association, of which he was on the executive 1928-36 and chairman in 1936.

Southland Enlargement Continues Under Way

LUFKIN, Tex.—The Southland Paper Mills, Inc., here, reports that construction now in progress at the plant will boost productions to near 350 tons per day. As previously reported, construction started in May, 1946, but shortages in material will prevent opening of the new unit for several months.

An informed source pointed out that the expansion program, which is costing about $6,500,000, will double the capacity of the grinder room and the newsprint production department.

Present output on newsprint is 170 tons per day.

Container Corp. of America Plans New Preferred Issue

Container Corp. of America has applied for S.E.C. approval for 100,000 shares of preferred stock par value $100. The issue will be underwritten by a group of investment banking firms headed by Kidder, Peabody & Co. The net proceeds from the sale of the preferred stock will be added to the company's general cash funds. The company has under way a program of further improvements, replacements and additions to its manufacturing plants and facilities aggregating approximately $16,150,000 of which approximately $3,760,000 had been spent by January 31, 1947. The dividend rate, redemption provisions and other details of the issue are subject to negotiations between the company and the underwriters and will be announced later.

This financing, through a mechanical error, was wrongly attributed to the National Container Corporation at the time that that company's annual report was published as a part of the week's news two weeks ago.

Scotch Tape Patent Suit Ends In Damage Payment

CHICAGO — The United States District Court at Chicago entered its final decree on March 13 in the suit of the Minnesota Mining & Manufacturing Company versus International Plastic Corporation and David Smart. Following the decision of the United States Circuit Court of Appeals on January 9, 1947, the District Court found the Minnesota company's "Scotch" Tape basic patent to be valid and infringed in respect to all claims in suit. The Court also ordered the payment of costs and damages in the amount of $50,000, and permanently enjoined the defendants, their officers, agents, and employees, from the manufacture and sale of transparent, film-backed tape in infringement of the patent.

International has paid the costs and damages as provided in the decree, and the 3M Company has given them permission to fill, prior to May 12, 1947, certain orders already on hand at the time of the entry of the decree.

Twin City Safety Council

MENASHA, Wis. — Pertinent safety questions were discussed for foremen and supervisors at a recent meeting at Germania hall by the Twin City Safety Council. Members of the panel board were F. D. Frederickson, chief inspector of the industrial commission; A. Bruemer, deputy; W. P. Waniser, safety engineer for Employers Mutuals; Jim Campion, adjustor for Employers Mutuals; and Al Johnson, safety director of Kimberly-Clark Corporation.

Saskatchewan Grows As Pulpwood Source

VANCOUVER, B. C. — Pulpwood cutting has now become the second most important branch of the timber industry in northern Saskatchewan. At least two-thirds of the pulpwood produced in Saskatchewan comes from the Hudson Bay Junction area, where from between 50,000 to 75,000 cords are harvested annually. The town of Hudson Bay Junction acts as a supply center and is kept busy throughout the winter. Approximately $500,000 is the yearly turnover and nearly 1,000 men are given part time or full work during the winter.

Both large and small operators can produce this timber in the area. Of the 70,000 cords to be shipped out of Hudson Bay Junction this year, half of it will be taken out by small operators, usually settlers living close to the forested areas.

The pulpwood operators do not cut anything that can be made into saw logs or merchantable timber. About 90 percent of the pulpwood cut in this area is black spruce which grows on low lying land and is much slower growing than other trees. For instance, some black spruce estimated to be over 100 years old is only four inches to six inches in diameter. White spruce of the same age would average 18 inches to 22 inches in diameter. Some white spruce is cut for pulpwood but only under government restrictions where thinning is necessary for proper growth.

The pulpwood industry started in this district in 1927 when the Manitoba Pulp and Paper Company mill was built at Pine Falls, Man. This opened up a profitable market which stimulated interest but it slowed down during the depression years of 1929 to 1936.

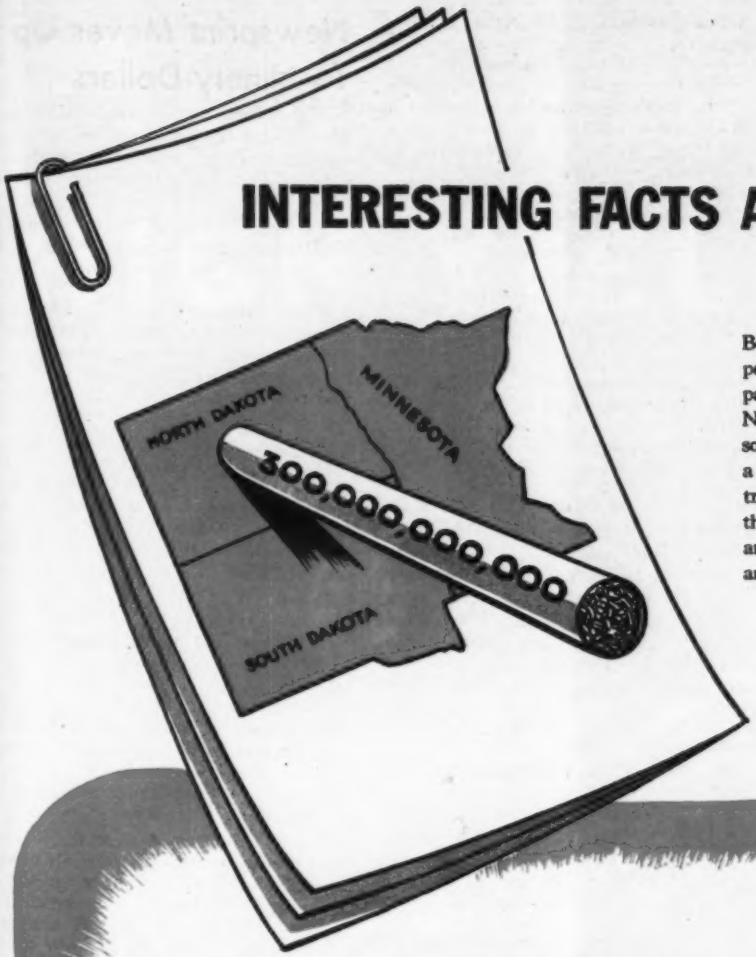
As new uses for pulp were discovered the demand increased again and prices went up. Buyers came in from the United States and this stimulated interest in the industry. Then the war years increased the demand again.

Some idea of the demand can be seen from the fact that during 1927 pulpwood sold at $5 a cord loaded in the car. It now brings $9.50 a cord for rough and $13 for peeled. In the depression years a cutter got $1.50 a cord. Today he gets $3.25 to $3.50 a cord. He can make about $6 a day after paying board.

Gottesman Elects Sheldon To be a Vice-President

NEW YORK—As part of a program of further expansion, D. Samuel Gottesman, President of Gottesman & Company, Inc., woodpulp agents and importers, makes known the election by the board of directors of the company of Benjamin I. Sheldon as vice-president, in addition to the office of treasurer which he presently holds.

INTERESTING FACTS ABOUT PAPER



Before the war the United States was dependent on outside sources for cigarette paper, made entirely from linen rags. Now, seed flax, grown mostly in Minnesota and the Dakotas, is utilized to make a thin, strong, white paper for the country's 300 billion cigarettes, and most of those smoked in South America, Europe, and the Far East, as well as for books, and even national currency.

INTERESTING FACTS ABOUT ACID ORANGE Y

Acid Orange Y is one of the most extensively used acid colors. Its brilliant shade, excellent solubility, and economy make it suitable for all types of coloring—beater, calender, dipping, and coating.

It is suitable in the production of high grade paper as well as the cheaper groundwood papers. It is extensively used in the production of salmon, mandarin, tan and brown colors in poster, cover, boxboard, leatherboard, wrapping paper, and sheathing.

In the deeper shades, better retention is obtained by increasing the amount of size and alum.

Consult your Calco representative for more complete details.

Calco

CALCO CHEMICAL DIVISION
Heller & Merz Department

AMERICAN CYANAMID COMPANY
Bound Brook, New Jersey

New York • Chicago • Boston • Philadelphia • Charlotte • Providence

Congress Buys Paper For Second Quarter

WASHINGTON—Awards were made public Monday by the Joint Congressional Committee on Printing for paper for use of the Government Printing Office for the three months period beginning April 1, 1947. Bids for the paper were received on March 17.

The awards are as follows, listed according to the specifications as printed in these columns last week when the bids were opened.

No. 3—Mudge Paper Co., 10.16 cents.

No. 4—Mudge Paper Co., 10.16 cents, (50,000 pounds).

No. 5—Mudge Paper Co., 10.16 cents (100,000 pounds).

No. 9—Mudge Paper Co., 9.31 cents.

No. 20—Franklin Research Co., 12.50 cents (500,000 pounds).

No. 22—Mead Sales Co., 9.56 cents.

No. 34—R. P. Andrews Paper Co., 8.58 cents.

No. 38—Barton Duer & Koch Paper Co., 10.30 cents.

No. 39—Barton Duer & Koch Paper Co., 9.94 cents, 100 pound basis. Barton Duer & Koch Paper Co., 9.25 cents, 120 pound basis.

No. 45—R. P. Andrews Paper Co., 9.21 cents.

No. 47—Howard Paper Mills, Inc., Aetna Paper Co. Division, 15.77 cents, 200,000 pounds. Old Dominion Paper Co., 17.20 cents, 300,000 pounds.

No. 50—D. L. Ward Co., 16.98 cents (150,000 pounds).

No. 52—Stanford Paper Co., 13.07 cents.

No. 53—D. L. Ward Co., 11.98 cents (800,000 pounds). Cauthorne Paper (800,000 pounds). Cauthorne Paper Co., Prevailing Price (200,000 pounds). R. P. Andrews Paper Co., 10.09 cents (850,000 pounds). Stanford Paper Co., 11 cents (200,000 pounds).

No. 55—R. P. Andrews Paper Co., 9.07 cents.

No. 56—R. P. Andrews Paper Co., 8.48 cents.

No. 61—Paper-Corporation of United States, 11.90 cents (200,000 pounds). Barton Duer & Koch Paper Co., 11.69 cents (300,000 pounds).

No. 69—Franklin Research Co., 23 cents.

No. 75—Barton Duer & Koch Paper Co., 35 cents.

No. 76—Paper Corporation of United States 31.75 cents (70,000 pounds). Old Dominion Paper Co., 28,56 cents (30,000 pounds).

No. 78—Old Dominion Paper Co., 29.58 (10,000 pounds).

No. 85—Barton Duer & Koch Paper Co., 35 cents.

No. 105—Howard Paper Mills, Inc., Aetna Division, 22.26 cents.

No. 106—Howard Paper Mills, Inc., Aetna Division, 18.09 cents (200,000 pounds).

No. 107—Howard Paper Mills, Inc., Aetna Division, 18.09 cents (200,000 pounds).

No. 108—Howard Paper Mills, Inc., Aetna Division, 18.09 cents.

No. 109—Franklin Research Co., 18.95 cents (400,000 pounds). Howard Paper Mills, Inc., Aetna Division, 17.12 cents (400,000 pounds).

No. 113—Howard Paper Mills, Inc., Aetna Division, 18.81 cents.

No. 114—Howard Paper Mills, Inc., Aetna Division, 17.84 cents.

No. 128—Barton Duer & Koch Paper Co., 34.15 cents (32 pound basis); 33.17 cents (40 pounds basis).

No. 150—D. L. Ward Paper Co., 12.27 cents.

No. 154—Howard Paper Mills, Inc., Aetna Division, 18.09 cents.

No. 155—Howard Paper Mills, Inc., Aetna Division, 18.09 cents.

No. 189—Barton Duer & Koch Paper Co., 21.15 cents.

No. 191—Barton Duer & Koch Paper Co., 21.90 cents (50,000 pounds —280 pound basis). R. P. Andrews Paper Co., 19.50 cents (50,000 pounds —220 pound basis).

No. 196—Barton Duer & Koch Paper Co., 33.46 cents.

No. 200 — Perkins-Goodwin Company, 13.15 cents; 12.90 cents; 12.80 cents.

No. 203—R. P. Andrews Paper Co., 11.88 cents.

No. 206—R. P. Andrews Paper Co., 18.88 cents.

No. 252—Stanford Paper Co., $20.60 per 1,000 sheets.

No. 271 — Paper Corporation of U. S., 13.50 cents per pound.

No. 310—R. P. Andrews Paper Co., 12.86 cents.

No. 325—Whitaker Paper Co., 7.67 cents (1,000,000 pounds). R. P. Andrews Paper Co., 7.55 cents (700,000 pounds).

No. 326—Whitaker Paper Co., 7.67 cents (1,000,000 pounds). R. P. Andrews Paper Co., 7.55 cents (700,000 pounds).

No. 327—Whitaker Paper Co., 7.67 cents (1,000,000 pounds). R. P. Andrews Paper Co., 7.55 cents (800,000 pounds).

No. 368—Consolidated Paper Co., 7.82 cents.

No. 369—Mead Sales Co., 6.175 cents (.050 to .060 caliper); 5.80 cents (.060 caliper and above).

No. 370—Mead Sales Co., 6.175 cents (.050 to .060 caliper); 5.80 cents (.060 caliper and above).

OTC Will Assume Chemical Controls

WASHINGTON — Remaining controls under Civilian Production Administration, including those over chemicals, tin, antimony, rubber, will be transferred to the Office of Temporary Controls, April 19, when CPA enters liquidation, it was learned this week. Disposition of export control will depend on the outcome of Congressional debate on the President's recommendation that these controls be retained for another year.

Newsprint Moves Up To Ninety Dollars

New York - The trade this week predicted a general rise of $6 a ton in the price of newsprint, following action by Canadian International Paper Sales Co.

Abitibi Power & Paper Company also reported an increase of $6 a ton in the price of newsprint, effective April 1.

The company says it had notified its customers in Canada and the United States of the increase which applies to standard weight newsprint paper and rolls. Present basic price is $80 a ton in Canada and $84 at New York.

At the start of 1946 newsprint, then under OPA control, was priced at $67 a ton. This level held until Canada revalued its currency to par with the United States dollar in July, which resulted in a boost of $6.80 a ton to $73.80.

When OPA was revived, following the July lapse, the price went back to $67. In late August OPA authorized a $7 increase to $74 and another $10 raise to $84 in October.

The present action followed testimony before a Senate Small Business subcommittee investigating newsprint supplies that small publishers had been offered newsprint at prices ranging to $250 a ton.

Severe weather in Canada, which tangled transportation already hampered by inadequate rolling stock, recently forced many domestic publishers to limit space for advertising and curtail the size of editions to make available supplies of newsprint go as far as possible.

Howard Mills Re-elect Roster of Officers

DAYTON, O.—Harry A. Legge, president of the Howard Paper Mills, Inc., reported at the annual meeting of stockholders March 10 that all four divisions of the company had completed a satisfactory year for 1946. No figures, however, were released. Following the stockholders meeting, a meeting of members of the board was held. All officers were reelected. They include: Harry A. Legge, president; W. B. Zimmerman, executive vice-president; Charles F. Goodenough, vice-president; K. P. Geohegan, vice-president; E. H. Hoffman, treasurer; H. W. Santen, assistant treasurer; Joseph A. Cobey, secretary, and Karol C. Koehler, assistant secretary and controller.

Allchin Succeeds Rushmore

Rochester, N. Y. — The paper and cordage business originated by Horace M. Crawford and operated for a short time following his death in 1944 by the W. A. Rushworth Company, has been taken over by L. L. Allchin, at 372 Exchange Street.

Sutherland

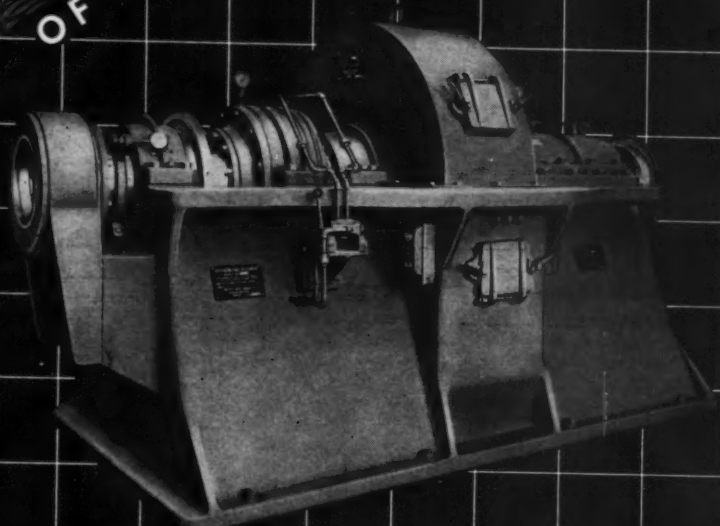
HIGH YIELD

SULPHATE PROCESS

MORE PULP PER POUND OF WOOD

MORE PULP PER POUND OF WOOD

MORE PULP PER POUND OF



SUTHERLAND *continuous*
BEATING AND REFINING SYSTEM

SUTHERLAND REFINER CORPORATION
TRENTON, NEW JERSEY · *Manufactured in the United States by Valley Iron Works Co., Appleton, Wis.*

SUTHERLAND REFINER LIMITED, 319 DRUMMOND BLDG., MONTREAL, P.Q., Manufactured in Canada By The John Bertram & Sons Co. Ltd., Dundas, Ontario

FINANCE

St. Lawrence Almost Trebles Net Profit

MONTREAL—Net profit of $1,241,504 is reported for St. Lawrence Paper Mills Co. for the year ended December 31, 1946. This is equal to $9.94 per share on the 6 percent preferred shares outstanding and compares with net profit of $431,460, or $3.39 on preferred shares, in the previous year.

During 1946 the company resumed full dividend payments of $6 per share on the preferred stock and declared an additional 75 cents on account of arrears. With the payment of the regular quarterly dividend for the first quarter of 1947 the company is paying an additional $1 on account of arrears which will then be reduced to $67.75 per share. Surplus at the end of 1946 was $1,014,566 as compared with $615,361 at the end of 1945.

J. I. Rankin, president of the company, states that during 1946 the company operated at 92 percent of capacity and produced an all-time record of 172,437 tons of newsprint. Logging operations were satisfactory during the past season, and, providing driving conditions are favorable, sufficient pulpwood will be available to permit continued operations at full capacity.

Operating profit in 1946 amounted to $3,252,353, including dividends of $450,021 from Lake St. John Power & Paper Co., a subsidiary. This compares with operating profit of $1,276,110 in 1945 which included $274,185 as dividends from Lake St. John. Provision for depreciation was increased to $850,000 from $600,000 and income taxes were up to $1,050,000 from $186,912. A new pension plan was put into effect for which contribution of $60,000 was provided.

Investment in Lake St. John Power & Paper is shown at $2,891,896, an increase of $160,473 over the previous year which includes purchase of an additional 2,091 shares of common stock.

During 1946, St. Lawrence Paper Mills purchased and cancelled 2,535 shares of its preferred stock leaving 124,875 shares outstanding at December 31, 1946. Mr. Rankin states that during the period 1936-1946, the company has purchased and cancelled a total of 17,381 preferred shares at a capital profit of $861,434 in addition to $1,194,944 of dividend arrears which were eliminated.

Hollingsworth Whitney 1946 Net $1,493,047

BOSTON — Hollingsworth & Whitney Company report for 1946 consolidated net profit of $1,493,047 after all charges, including provision for federal taxes on income. Deducting preferred dividends, the balance amounted to $3.41 per share on 388,390 shares of common stock. These earnings compare with consolidated net for the preceding year of $642,143. Adjusting for the two-for-one split of the common stock early in 1946, the 1945 earnings amounted to $1.71 per share on the equivalent of 375,406 shares.

Puget Sound Income Doubled in 1946

Bellingham, Wash — Independently audited net income of Puget Sound Pulp & Timber Company for 1946 amounted to $1,320,507, equal to $3.83 a share on the common stock, in comparison with $602,624, or $1.64 per common share, for 1945, the 1945 figures including $193,094, or 59 cents a share, net capital gain from an instalment payment received on account of Canadian timber properties sold.

Pulp production in 1946 totaled 84,257 tons, against 87,641 tons the year before. Waste sulphite liquor was converted into 1,752,747 gallons of industrial alcohol in 1946, compared with 1,292,937 gallons in 1945, commencing March 2nd.

Net sales totaled $7,187,683 in 1946, as compared with $6,216,860 in 1945. Interest and other non-operating income amounted to $146,093 in 1946, up from $110,971 in 1945. After cost of sales and other deductions, income subject to Federal tax amounted to $2,129,850 in 1946, in comparison with $842,341 in 1945. Provision for Federal taxes took $809,343 in 1946, against $432,811 in 1945.

The company's new hydraulic barker and whole log chipper, completed in May at a cost of $939,898, effected an increase of about 17 per cent in amount of pulp produced per unit of logs consumed.

Additions to domestic timber reserves during 1946 totaled 85 million feet, more than replacing depletion of 67 million feet through logging operations. After reserve for depletion, the company's investment in domestic timber reserves amounted to $1,446,720 at December 31, 1946, in comparison with $1,269,642 one year earlier.

FINANCIAL RECORD OF THE WEEK

New York Stock Exchange

High, Low and Last for Week Ending March 22, 1947

STOCKS

	High	Low	Last
A. P. W.	5¾	5½	5½
Armstrong Cork Co.	51	49⅝	50½
Armstrong Cork Co., pf.	106	105¾	106
Celotex Corp.	30	28⅝	30
Celotex Corp., pf.	21	21	21
Certain-Teed Products Corp.	17½	16⅝	17⅛
Certain-Teed Products Corp., pf.	16⅞	16⅜	16¾
Champion Paper & Fibre Co.	23	22½	23
Champion Paper & Fibre Co., pf.	110	110	110
Congoleum Nairn Co.	27¾	26½	27½
Container Corp. of America	43½	41½	43½
Crown Zellerbach Co.	29⅝	29	29½
Crown Zellerbach Co., pf. 4.20	107½	107⅛	107⅛
Crown Zellerbach Co., 4 pf. 4	117¼	115¾	116⅞
Dixie Cup Co.	31	30⅞	31
Dixie Cup Co. A	53	52	53
Flintkote Co.	32⅜	30½	32¼
Flintkote Co., pf.	....	....	....
Robert Gair	7	6⅝	6¾
Robert Gair, pf.	20	20	20
International Paper Co.	47¼	45⅜	47
International Paper Co., pf.	104	104	104
Johns Manville Corp.	125½	122	125½
Johns Manville Corp., pf.	....	....	....
Kimberly-Clark Corp.	25½	24¾	25⅛
Kimberly-Clark Corp., pf.	109	108	108½
Mac Andrews & Forbes	36½	35¾	36½
Mac Andrews & Forbes, pf.	....	....	....
Marathon Corp.	25	23¾	25
Mead Corp.	20⅝	19¼	20⅝
Mead Corp., pf. 4¼	102½	102½	102½
Mead Corp., pf. 2	46	46	46
National Container Corp.	39¼	36⅝	39¼
Paraffine Companies, Inc.	71	70½	70½
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	23½	22	23⅜
Rayonier, Inc., pf.	37¼	37¼	37¼
Ruberoid Co.	52½	51	52½
Scott Paper Co.	43½	42	43
Scott Paper Co., pf.	99¼	99	99¼
Sutherland Paper Co.	43½	41	43½
Union Bag & Paper Corp.	31⅛	30	30½
United Paperboard Co.	17	16½	16½
U. S. Gypsum Co.	104	98	104
U. S. Gypsum Co., pf.	....	....	....
West Virginia Pulp & Paper Co.	41¼	40¼	41¼
West Virginia Pulp & Paper Co., pf.	114¼	112	113

BONDS

Abitibi Pulp & Paper Co., 5s '53	....	....	....
Celotex Corp. 3½s '60	....	....	....
Certain-Teed Products Corp. 5½s '53	....	....	....
Champion Paper & Fibre Co. 3s '65	103⅜	103¼	103⅜
Mead Corp. 3s '66	....	....	....

New York Curb Exchange

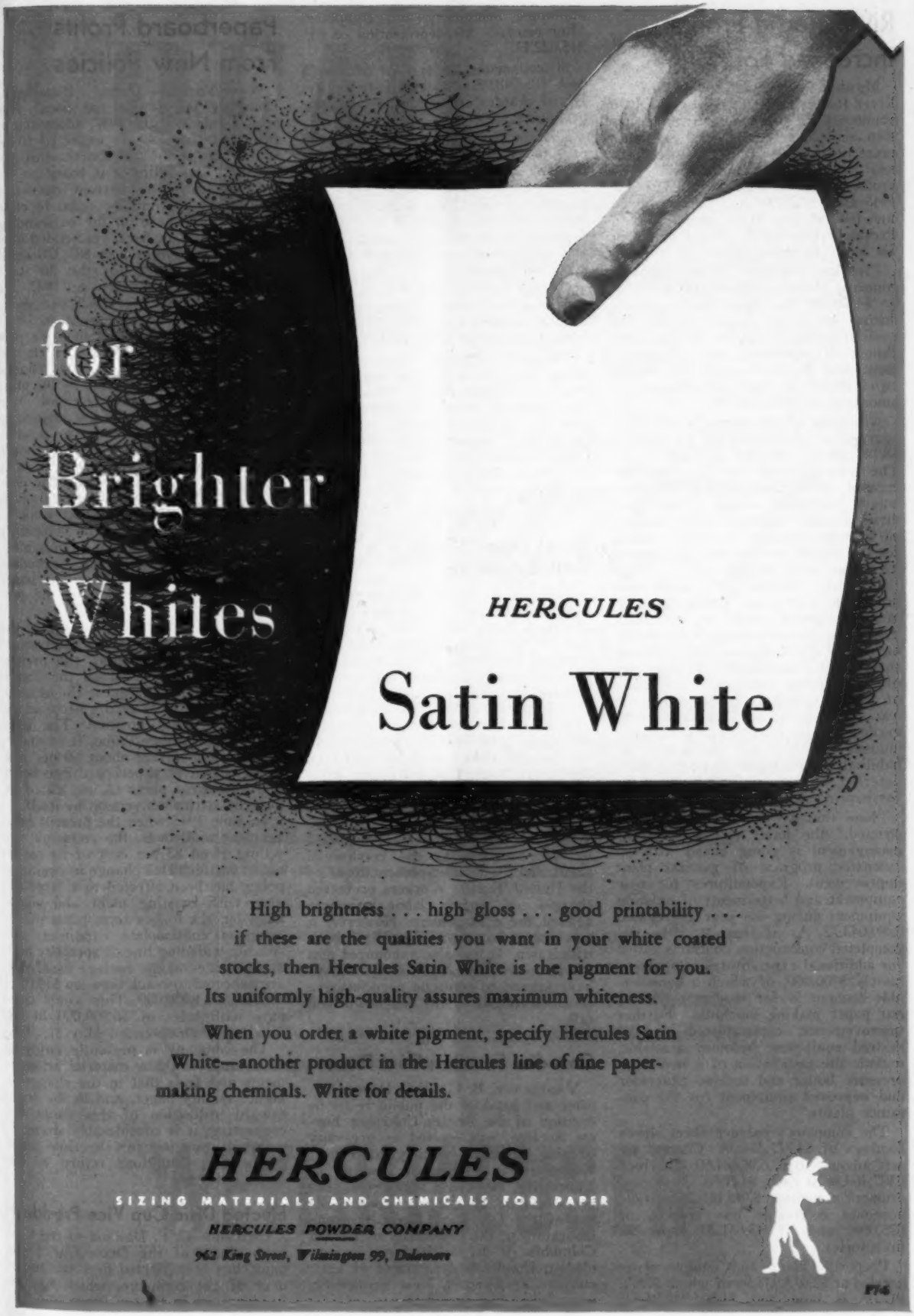
High, Low and Last for Week Ending March 22, 1947

STOCKS

	High	Low	Last
Great Northern Paper Co.	42	40½	42
Hummel Ross Fibre Corp.	31	29½	31
St. Regis Paper Co.	9⅜	9	9¼
Taggart Corp.	9	8¼	8¼

BONDS

American Writing Paper Co. 6s '61	....	....	....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P74

River Raisin Profits Increased Fourfold

MONROE, Mich. — Net profit of the River Raisin Paper Company for 1946 amounted to $647,698.03 after provision of $420,000 for federal and state taxes on income, according to the annual statement to stockholders. The profit compares with $164,923.57 for 1945 after $120,000 had been provided for federal and state income taxes, President Charles L. Wood states in his letter to stockholders.

President Wood's letter discloses company plans to expend approximately $400,000 for plant improvements during 1947, the major portion for modernization of paper making machines. Expenditures for new equipment and betterments of existing equipment during the past year amounted to $289,043.72.

Net sales of the company for 1946 aggregated $10,886,805.41 as against $8,161,284.10 for the previous year. The company's net working capital increased $378,350.98 during the year was $1,552,650.42 on Dec. 31 last. Cash dividends paid during the year amounted to approximately 40 cents a share for the 461,365 outstanding shares having a par value of $5.

President Wood's letter states that during the war years "various governmental controls made it extremely difficult to obtain additional equipment or even replacements for existing equipment. Furthermore, the necessity of maintaining continued production of various products required for the war effort could not easily be disregarded. As a result considerable amount of plant and equipment rehabilitation and replacement had to be deferred, as were most of our plans for improvement and expansion.

"Now that we are no longer so restricted," the letter continues, "your management is going ahead with an extensive program of general plant improvement. Expenditures for new equipment and betterments of existing equipment during the year aggregated $289,043.72. As at Dec. 31, 1946, uncompleted construction contracts called for additional expenditures of approximately $400,000, of which a considerable amount is for modernization of our paper making machines. Further improvements, contemplated as the desired equipment becomes available, include the installation of a new high pressure boiler and turbine generator and improved equipment for the container plants."

The company's balance sheet shows footings of $4,777,346.38. Current assets amount to $2,638,824.60, of which $387,460.80 is cash, $421,587.33 is government securities, $786,145.28 is trade accounts receivable less reserve of $25,000, and $1,043,631.28 represent inventories.

Property, plant and equipment is carried at $2,073,935.96 of which $267,517.07 is land and $1,806,418.81 is buildings, machinery and equipment after reserves for depreciation of $3,245,922.11.

Miscellaneous assets total $39,536.78 with $25,048.95 additional listed as deferred charges on unexpired insurance premiums.

Current liabilities are $1,086,174,27 of which $370,056.55 is trade accounts payable, $146,520.51 is payrolls and commissions, $135,961.63 is local and payroll taxes including employe income taxes withheld, $5,889.09 is employe deposits for purchase of savings bonds and $427,746.49 is estimated federal taxes on income.

Capital stock is carried at $2,306,825 for the 461,365 shares outstanding with capital surplus of $392,265.01 and earned surplus of $992,082.10.

The profit and loss statement shows sales, less discounts and freight allowed, of $10,886,805.41. The cost of the products sold was $8,963,770.79 with selling, administrative and general expense amounting to $866,749.16. Other income, interest earned and miscellaneous, amounted to $11,412.57 to bring the profit before taxes to $1,067,698.03.

Huyck Labor Dispute Settled Amicably

ALBANY, N. Y. — Settlement of a labor controversy at the mills of F. C. Huyck & Sons, Rensselaer, which involved two labor organizations, was reported last week. It was stated that several hundred employes had voted to affiliate with the United Textile Workers of America which lost jurisdiction over them last fall to the Federation of Woolen and Worsted Workers. In the fall of 1946, the firm signed an agreement with the federation after a majority of former members of the United Textile Workers organized the new union and negotiated a contract. When the federation was recognized by the company as the conditional agent, international representatives of the United Textile Workers preferred charges of unfair labor practices against the management. However, it was stated that the charges have been withdrawn. It was also announced that the company and labor representatives have agreed to continue negotiating a contract started by the federation last fall.

Canadian Foresters Elect Druce

VANCOUVER, B. C.—Eric Druce, forester and head of the public relations division of the British Columbia Forest Service, was elected as president of the Canadian Society of Forest Engineers at its annual meeting at Vancouver, recently. Mr. Druce succeeds Roscoe M. Brown, superintendent of the Dominion forest products laboratory at the University of British Columbia. R. E. Balch, forest entomologist, Dominion department of agriculture. Fredericton, New Brunswick, was elected vice-president.

Paperboard Profits From New Policies

New York — United Paperboard Company net profits for fiscal year which ends May 31, 1947, according to informed sources, are expected to be somewhere in the neighborhood of $1,200,000. This estimate is based on results to date and current operating conditions. It would be equal to close to $5.00 per share on the outstanding common. For the fiscal year ended May 31, 1946, net profit was $87,326 equal to 18c per share. For the 36 week period ended February 8, 1947 net profit was $813,958 or $3.28 per share.

The marked improvement in earnings is said to represent in some part the improvement in prices but in the main is a reflection of a broad change in operating policy adopted by the present management when it took over in June 1945. Basically the change in policy has been a change to production of higher grades of paperboard and a steadily increasing utilization of this output by the company for conversion to folding boxes. Pointing up this situation is the fact that while in the current fiscal year the company's output of paperboard will be only moderately above that of the preceding year, its tonnage production of boxes will be about double that of the previous year.

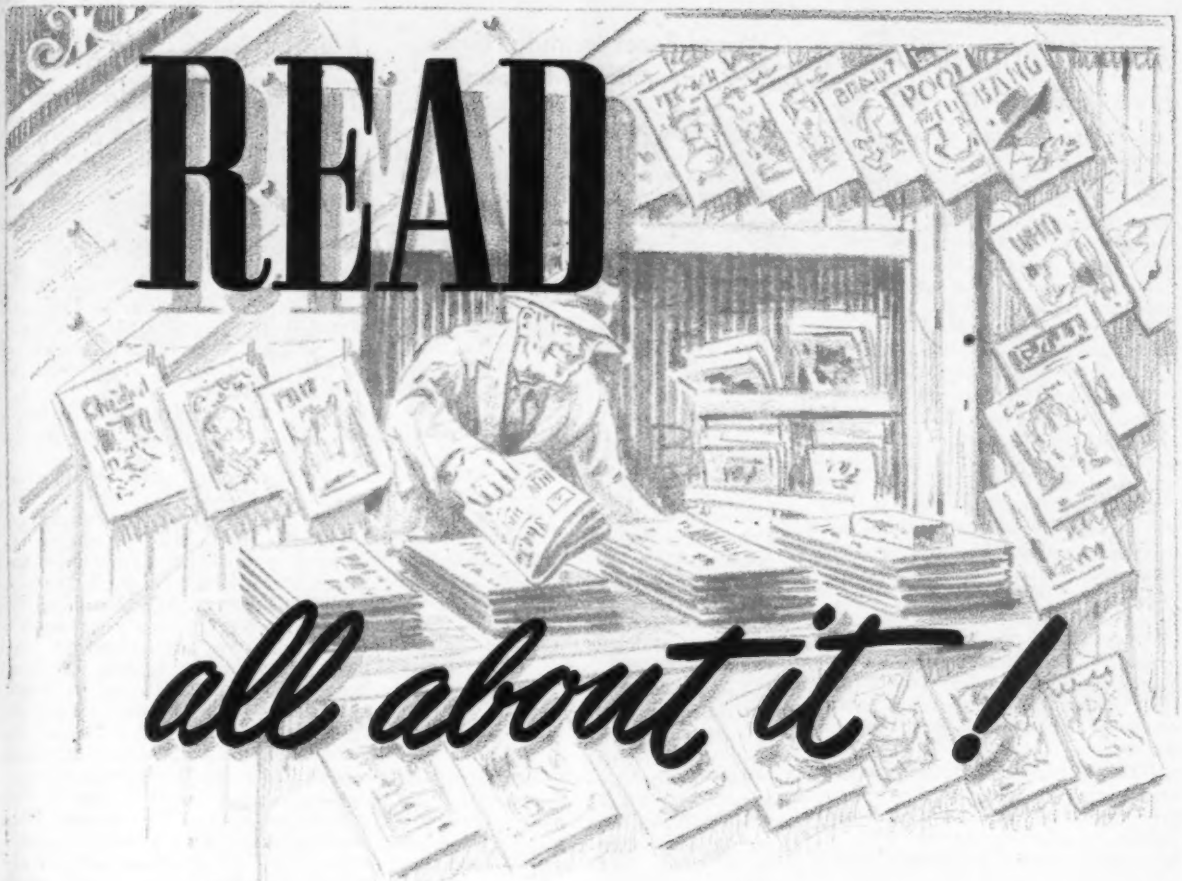
In steadily expanding the use of the paperboard it produces for the conversion into folding cartons, the present management has acted on the theory that the closer it can get to the ultimate consumer the more secure becomes the company's profit position. The company at the present time, it is understood, is converting about 60 per cent of its output of paperboard into boxes and ultimately plans to use all of its paperboard for conversion by itself.

In June 1945 when the present management took over, the company was selling about 83 per cent of its paperboard outside. This change in operating policy has been effected to a large degree with existing plant and equipment but the longer term plans of the company contemplate expansion and steadily widening line of specialty boxes. Net sales in the current fiscal year are expected to reach between $10,000,000 and $11,000,000. This would compare with sales of $6,500,000 in the fiscal year which ended May 31, 1946.

The company is presently enjoying much improved raw material arrangements and feels that in the change to higher quality paper, and in the trend toward utilization of this paper for converting, it is considerably strengthening its position for the time when competitive conditions return to the paper industry.

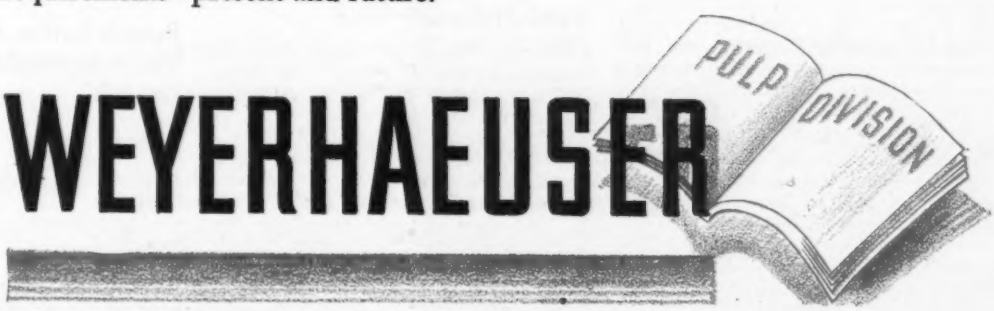
Elected Dixie Cup Vice-President

CHICAGO—C. F. Dawson of the Chicago offices of the Dixie Cup Company, has been elected first vice-president of the company, which has its headquarters in Easton, Pa.



And that's just what Mr. and Mrs. America are doing, for never has there been such a demand for magazines, newspapers, books, catalogs, and advertising matter. Paper manufacturers are continuing their splendid wartime efforts by running at full capacity to meet the record-breaking peacetime demand for paper and paper products.

The Pulp Division, Weyerhaeuser Timber Company, is supplied with pulpwood harvested from its extensive timber tracts operated on a sustained-yield basis. It can be depended upon to produce its share of pulp to help satisfy the industry's requirements—present and future.



Abitibi Earnings at Five Million in '46

TORONTO—Abitibi Power and Paper Company, Ltd., reported this week its profits for 1946 were $5,600,205, of which $1,453,652 was realized in the first four months of the year, while the company was under receivership. The latter amount was credited to deficit account at the termination of receivership on April 30. The $4,146,552 remainder was realized from operations under the present management and was credited to earned surplus.

"The sharp increase in the rate of earnings was due," the report said, "to substantial increases in the price of newsprint and sulphite pulp and to increased rate of production at all the company's mills since May 1, 1946."

The consolidated statement of profit and loss was prepared to show results from Jan. 1 to April 30 (in receivership) and results from May 1 to Dec. 31 (after reorganization).

Profits from operations, including exchange premium, before provision for depreciation and amortization, were $5,365,238 for the first period, compared with $15,203,400 for the second.

D. W. Ambridge, president and general manager, reported the company produced 14 per cent of all newsprint output in Canada during 1946. He paid tribute to G. T. Clarkson, the receiver and manager who guided the company for almost fourteen years.

Newsprint production for the year was highest in company history, totaling 610,683 tons, compared with 453,657 in 1945. Bleached sulphite totaled 57,090 tons, against 63,128 and unbleached sulphite pulp 28,394 tons, compared with 6,978.

National Gypsum Will Spend $500,000 at Western Board

KALAMAZOO, Mich.—Purchase of the former Western Board and Paper Company mill by the National Gypsum Company, which has been operating the King highway plant since last July, was completed last week, according to Melvin H. Baker, Buffalo, N. Y., president of the company. A half-million dollar modernization and improvement program at the mill already is underway, it was announced by Leonard L. Hank, who has been plant manager since last July. The paper-making machine is being improved and new equipment is being installed throughout the plant.

Present daily output of approximately 120 tons likely will be increased by about 15 per cent. The mill manufactures liner paper used in the production of gypsum board. The paper product from Kalamazoo goes to National's gypsum board plants at Fort Dodge, Ia., and National City, Mich., where gypsum sheathing, lath and wallboard are produced.

Waxed Paper Institute Names New Committee Members

CHICAGO—Four new members have been added to the executive committee of the Waxed Paper Institute and seven new committee chairmen have been appointed to head various industry-wide activities, it is reported by A. H. Noelke, secretary-treasurer of the Institute. The new executive committee members who were appointed for a period of three years are Paul M. Beach, Riegel Paper Corporation, New York, N. Y.; Stuart Irvine, Saniwax Paper Company, Kalamazoo, Mich.; William P. Patterson, The Specialty Papers Company, Dayton, Ohio; and C. C. Sherman, H. P. Smith Paper Company, Chicago. Karl R. Zimmer, of Zimmer Paper Products, Indianapolis, Indiana, was re-elected chairman of the executive committee. Other members who remain on the committee are B. F. Lacy, Southern Waxed Paper Company, Atlanta, Ga.; J. E. Edelstein, Rapinwax Paper Company, Minneapolis, Minn.; H. K. Snyder, Central Waxed Paper Company, Chicago; and George C. Wieman, Western Waxed Paper Company, Los Angeles.

Harold L. Bills, Saniwax Paper Company, Kalamazoo, Mich., was named chairman of the merchandising committee and will direct the Institute's national merchandising program for the coming year. Mr. Bill succeeds R. A. Nash, Marathon Corporation, Menasha, Wis.

Other committee chairmen who were appointed are: Statistical Committee—William P. Patterson, The Specialty Paper Company, Dayton; Industrial Relations Committee—T. A. Sullivan, H. P. Smith Paper Company, Chicago; Traffic Committee — E. P. Gerhart, Central Waxed Paper Company, Chicago; Government Committee—A. H. Noelke, chairman; A. Southon, Kalamazoo Vegetable Parchment Company, Kalamazoo, Mich.; Carl Diskin, Waxide Paper Company, Kansas City, Mo.; R. C. McCaskey, Minerva Wax Paper Company, Cleveland; Membership Committee—A. H. Noelke, chairman; Paul M. Beach, Riegel Paper Corporation, New York; J. E. Edelstein, Rapinwax Paper Company, Minneapolis; and H. K. Snyder, Central Waxed Paper Company, Chicago.

Erving Mills Present Claflin Patek-Phillippe Watch

ERVING, Mass. — Morris Housen, board chairman of the Erving Paper Mills, presented to Lewis L. Claflin, treasurer and recently sales manager of the company, a beautiful Tiffany "Patek-Phillippe & Cie, Geneva", gold watch, chain and charm. The charm bears the following inscription: "Feb. 1, 1947—Lew, a loyal friend to and with Erving Paper Mills from Feb. 1, 1916". The reverse side of the charm bears the initials "LLC" engraved in large script letters.

Abitibi Interest Taxable Income For Redeemer

TORONTO — The federal government is planning to bring down legislation at the present session of parliament regarding securities issued to refund accumulated income liabilities, and Hon. D. C. Abbott, minister of finance, announced last Tuesday that the five percent bonds of the Abitibi Power and Paper Co., Ltd., due in 1965, and issued only last year under a refunding plan, and expected to be redeemed shortly, would not be affected by the new legislation.

The interest portion of Abitibi bonds will be taxed as provided in the endorsement on the bonds.

The finance minister said, in making the announcement: "This particular bond issue carries an endorsement which was approved by the income tax division at the time of the issue, and the interest portion would be taxable income of the person redeeming the bond. The proposal in my statement a few weeks ago would likewise have made the interest content in these bonds taxable in 1947, but it would have been payable by the original recipient of the bond, rather than by the person redeeming it. It has since been represented to me that those who were negotiating between the bondholders and the trustees of the company recommended the final terms of agreement only after receiving definite assurance from the Income Tax Division regarding the tax aspects of the case, that the income tax treatment of the interest content of the bonds was an essential factor in the agreement, and that it would now be manifestly unfair to disturb this arrangement. I have reconsidered this matter very carefully and have decided that no special provision should be made regarding Abitibi bonds in the new legislation dealing with funding bonds. The interest portion of Abitibi bonds will be taxed as provided in the endorsement on the bonds; that is, the interest content will be taxable income of the person redeeming the bonds."

Mr. Abbott said he was making the announcement after reconsidering his statement of February 7, in which he had stated that the new legislation would give certainty to the law in cases where funding or refunding bonds have been issued in respect of unpaid arrears of interest.

Rubush Retires from Goslin-Birmingham

New York—James P. Rubush, vice-president and sales manager of Goslin-Birmingham Manufacturing Company, and former head of its New York office, has resigned in order to devote himself to other interests. A popular and well-liked figure in the paper, sugar and chemistry fields, the air lines are sure to miss Mr. Rubush who covered the country from coast-to-coast and from border-to-border.

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Boston Paper Trade Reelects President James R. Carter, II

BOSTON—James R. Carter, II, was reelected president of the Boston Paper Trade Association at the Sixty-first annual meeting and dinner of the organization in the Roof Ball Room of the Parker House. Reelected also were the following: First vice-president, W. N. Stetson, Jr.; second vice-president, F. Henry Savage; treasurer, T. Charles Casey; secretary, Frank B. Cummings; auditor, William C. Ross. The following committees were chosen: Executive, Norman Harrower, W. Edwin Porter, Matthew O. Byrne. Membership, Floyd H. Blackman, chairman, Hubert W. Lockhart, J. Frank Halloran, Edgar P. Hay, Gilbert T. Singleton. Arbitration, George W. Wheelwright, chairman, Charles A. Shaw, Henry C. Thayer, Albert P. Carter, Charles A. Esty. The nomination committee was composed of Col. Charles S. Proctor, J. R. Halkyard, Robert M. Stone, C. Edward Rice, and J. W. Vivian.

The president appointed the following committee of five to study the matter of dues and the classification of membership to make recommendations to the executive committee: Matthew O. Byrne, chairman, Floyd H. Blackman, H. L. Carter, T. Charles Casey, Frank B. Cummings.

President Carter presided in the business meeting with an attendance of 233, the largest ever. Jack Whitney led in the singing, which just preceded the business session. In the absence of Secretary Cummings, W. Edwin Porter acted in that capacity. The secretary's report showed a total membership of 241, with one member lost by death. All rose in silent tribute to the memory of Arthur L. Hobson. The following new members were elected: F. Allan Barr, Holyoke Card and Paper Company; Jonathan O. Bulkley, Carter Rice & Co., Inc.; Douglas E. Donovan, Specialty Converters, Inc.; James A. Leyden, Hampden Glazed Paper and Card Company; J. C. Marvin, Carter Rice & Co.; Frank H. Sellers, Jr., United States Envelope Co.; Wilbur C. Shoemaker, Specialty Converters, Inc.; John G. Reynolds, Brown Co., New York; Herbert P. Smith, Tileston and Hollingsworth Company; Paul J. Welch, Kalamazoo Vegetable Parchment Co.; Rex W. Hovey, Oxford Paper Co.; H. A. S. Read, Jr., owner of H. A. S. Read, Inc.; T. K. Davis, Hollingsworth & Whitney Co.; Robert W. Foley, Hollingsworth & Whitney Co.; Alfred M. Barnard, Percy D. Wells; Charles E. Brown, Andrews Paper Co.; Alfred C. Sandberg, Andrews Paper Co.

Dr. J. Anton de Haas, Wm. Ziegler Professor of International Relationships at the Harvard Graduate School of Business Administration, international author and lecturer, and member of Foreign Policy Association, gave a dynamic and well received address on the subject, "Is Economic Cooperation Possible?"

Discussing international cooperation, Dr. de Haas said that "whatever happens to the world happens to us. There are mighty few who would advocate returning to isolationism. We are all in favor of cooperation. In a complex situation, it is not easy to know how to be good. We are appalled by the sacrifice that will be demanded of us. Almost everything we do is in terms of competition. We live in an atmosphere of competition. We can cooperate when we see how we can reach an immediate benefit from cooperation. Countries abroad have changed from lending to borrowing countries. The banks of Great Britain are in no position to lend money to buy from the United States. Today Great Britain is in great debt. This is true of all the European countries. The only way they can now pay is by export, but they can't import. We have begun to help them. The people are still inadequately fed. In Holland, the women can't buy shoes; they can't buy food." The speaker went on to show how the countries which have received aid from us are getting to their feet. "Can we afford to lend the money? It may result in increased prices. The question should be: Can we afford not to lend the money? It would mean continued chaos, continued need, continued hunger. The world over, when we are in economic distress, we look to a new leader. The demand for strong leaders does not usually arise when a country is prosperous. We should use our financial power as a political weapon. If we do not make it possible for goods to come here, it will be another 1929. We are at the crossroads. Either we quit lending, which means chaos abroad, or we continue to aid the countries who need aid, but we must in some way make provision for more imports than we are getting. We need sound cooperation of the business world. Only through this lies a way to world trade, a world prosperity and peace."

Sulphite Pulp Prices Rise

NEW YORK — Manufacturers of chemical pulp have announced increases ranging from $6 to $10 a ton, to become effective April 1 to April 15. Bleached sulphite will be raised to a $121 to $125 a ton range and unbleached sulphite pulp to a $115 to $120 a ton range.

Job Analysis Technique Interests Chicago Group

CHICAGO—About one hundred members and guests of the Chicago Professional Paper Group were again treated to a top flight program at the regular monthly dinner meeting at the Chicago Bar Association. This time it was personnel and the over-all subject of the meeting, "You and Your Job," was most capably handled by three outstanding authorities in their respective lines. Each did a splendid job of reviewing new procedures for determining the type of work and responsibility for which a man is best fitted. Two of the three used slides to illustrate their talk and all questions were withheld until the three guest speakers completed their remarks. The three were Ralph Landes of the Western Electric Company, Hawthorne Works; Joseph E. King, Ph.D., Director of Research, International Business Research; and Fred A. Replogle, Ph.D., partner of Rohrer, Hebler and Replogle, Psychological Consultants to Management. Mr. King perhaps grabbed a good share of the attention because of his long experience with men in the armed forces during war time. The speaker had obviously worked with thousands of men in setting up capacities for work, capabilities, potentialities, etc. He also presented a form listing many possible vocations which attracted the attention of those present to the extent that they asked for, and will receive, copies of the form for further study.

The techniques involved in successful job analysis, personnel selection and evaluation of top executives were forcefully brought out by all speakers and the many questions asked were indicative of the interest generated. President Long of the Container Corporation of America, opened the meeting after which Program Chairman Guth of the Bee Chemical Corporation took over and handled the intensely interesting question and answer period.

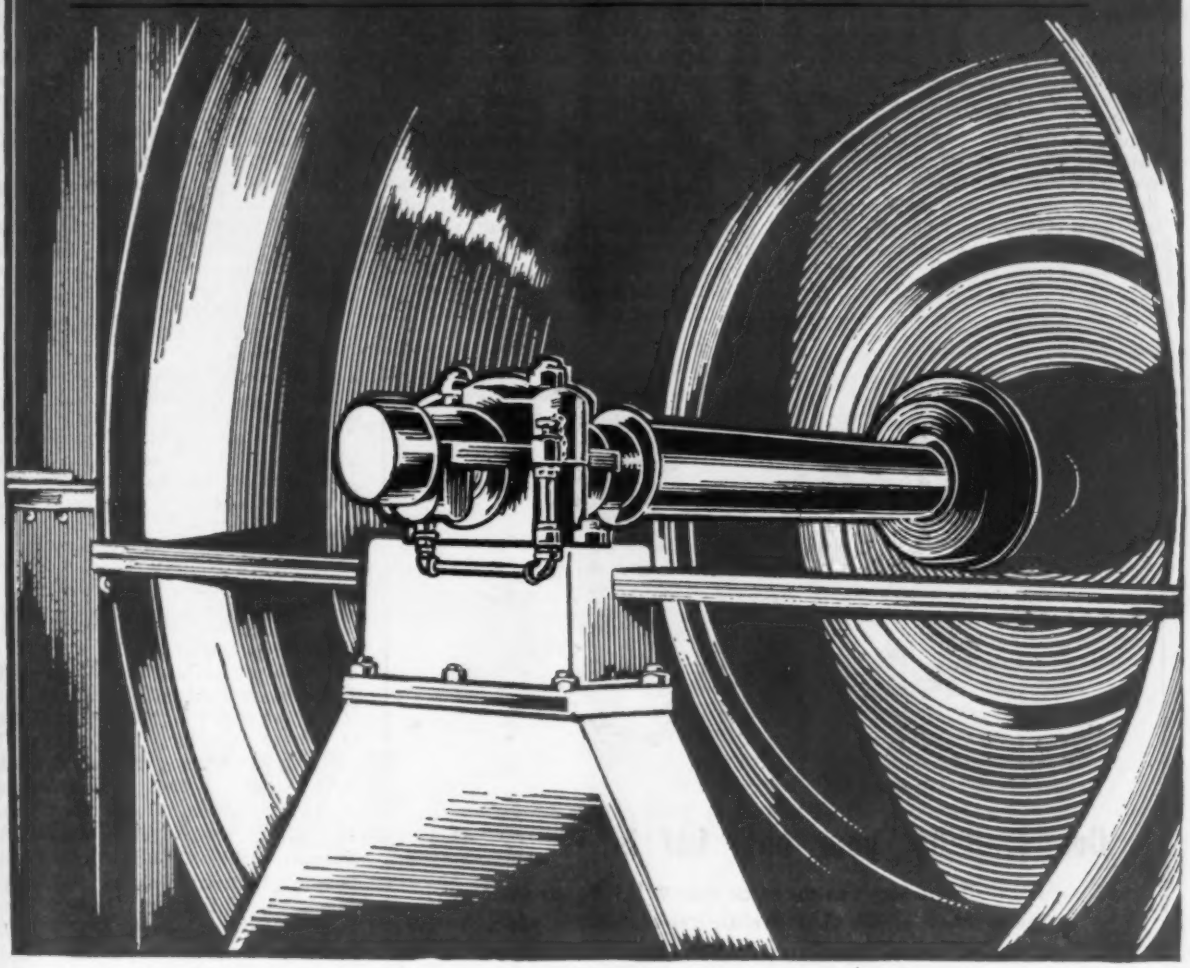
Empire Paper Dealers Meet

SYRACUSE, N. Y.—A two-day meeting of the Empire State Paper Association took place at the Hotel Syracuse, March 4 and 5, where various national and local activities were discussed, and a joint dinner for mill representatives and paper merchants was held on the afternoon of the 4th. In attendance at the merchant meetings were Messrs. Londergan and Leathers of the National Paper Trade Association staff, and the speaker for the joint dinner was W. G. Leathers.

Booton Buys for H & W

BOSTON — Hollingsworth & Whitney Company has appointed John G. Booton as purchasing agent, effective March 24, 1947, to succeed Alexander Jenkins, Jr., resigned.

"BEARINGS RUN 10% COOLER



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For aid in the selection of Tycol greases best suited for your particular needs, contact your nearest Tide Water Associated office today.

LUBRICATION—"ENGINEERED TO FIT THE JOB"

Waste Trade Hears of Improved Packaging

(Continued from page 7)

secretary of the Sanitary Institute of America; and Louis A. Spiess, general council of the National Association of Waste Material Dealers. Dr. Lewis, of the Appleton Research Institute, which has won such wide acclaim from the paper industry, outlined problems involved in utilizing rag waste for fine paper making, reported on the progress that had been made in solving these problems and likewise pointed out the necessity for improvement here to take the pressure off of the shortage of pulp which virtually all speakers during the three day session stressed as an alarming characteristic of the present day.

One of the outstanding social events of the meeting was the president's party held at the College Inn in the Hotel Sherman on Monday evening, March 17. At that time the National Association of Waste Material Dealers honored its outgoing president, Paul Joseph White, with members of the association's western division acting as the hosts. Members of the convention and banquet committee included Arthur U. Claghorn, Pioneer Paper Stock Company; Harold Shilling, United States Paper Supply Company; Arnold Epstein, Continental Paper Grading Company; David Charak, Federal Paper Stock Company; Stuart Sutphin, I. V. Sutphin Company; and Harry N. Cohen, Acme Paper Stock Company.

During the week the local waste paper market continued to show improvement as far as collections are concerned and there were reports that these collections now virtually equalled consumption. Prices were reported unchanged with mills paying $36 a ton for corrugated, $30 for news and Rx $20 for mixed paper. Receipts which declined in cold weather now are nearly equal to consumption and can be expected to improve within a few weeks, according to sources checked during the waste paper convention here. Mills are said to be making preparations for heavy collections through the early Spring months to be used to build up reserves for use next winter when the weather will again adversely affect collections.

Joseph H. Tyroler of Tyroler Metals, Cleveland, was elected president of the National Association of Waste Material Dealers, Inc. The election was the last order of business at the association's annual convention. Sidney Danziger and Harris Goldman, New York, and James T. Flannery, Jersey City, N. J., were elected vice presidents. Charles M. Haskins was re-elected secretary-treasurer and George W. Reid was named assistant treasurer.

Seventeen directors also were elected. New to the board were Ralph O. Williams, and Arthur Rosenfeld, New York, and James K. McElligott, Akron, O. Other directors will be Leo J. Messinger, Chicago; Walter T. Clark, E. J. Keller, Carlton B. Overton and Paul Jos. White, all of New York; M. F. Berg, Los Angeles; Marshall A. Shapiro, Oakland, Calif.; Jules Glant, Seattle; Bernard Shapiro, Baltimore; James T. Flannery, Jersey City; Robert Miller, Newark, N. J.; A. L. Newman, Syracuse, New York; Herman Ladensen, Philadelphia; and Egmont T. Frankel, Toronto, Canada.

The Scrap Rubber Institute, at its meeting gave its officers and executive committee power to investigate reports that the federal government planned a subsidy of synthetic production. The officers are to have authority to protest such subsidization if they consider it advisable.

Standardized packing and grading and the question of freight rates were discussed at a meeting of the Wool Stock Institute.

Both organizations discussed the problems created by reported shipment of inferior materials and products to foreign countries. The same topic was considered by other groups earlier in the convention. Speakers said good will for American products is destroyed when shipments do not meet specifications, and urged that the situation be rectified so that American shippers will continue to receive foreign business when it is needed most."

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It's really no secret in the trade that W. G. P. has what it takes. Here at W. G. P. we are "specialists" in paper and paper board "specialties." You undoubtedly have created many new and unusual paper products as a result of your war experience and research. Our sales organization stands ready to put forth a concentrated effort in launching these new products. Let our experience in the proper presentation and application of paper specialties go to work for you now! With a background of nearly a century as distributors for leading paper mills, W. G. P. can do a job for you on paper, paper board, and specialties. Give your new products the benefit of W. G. P.'s reputation.

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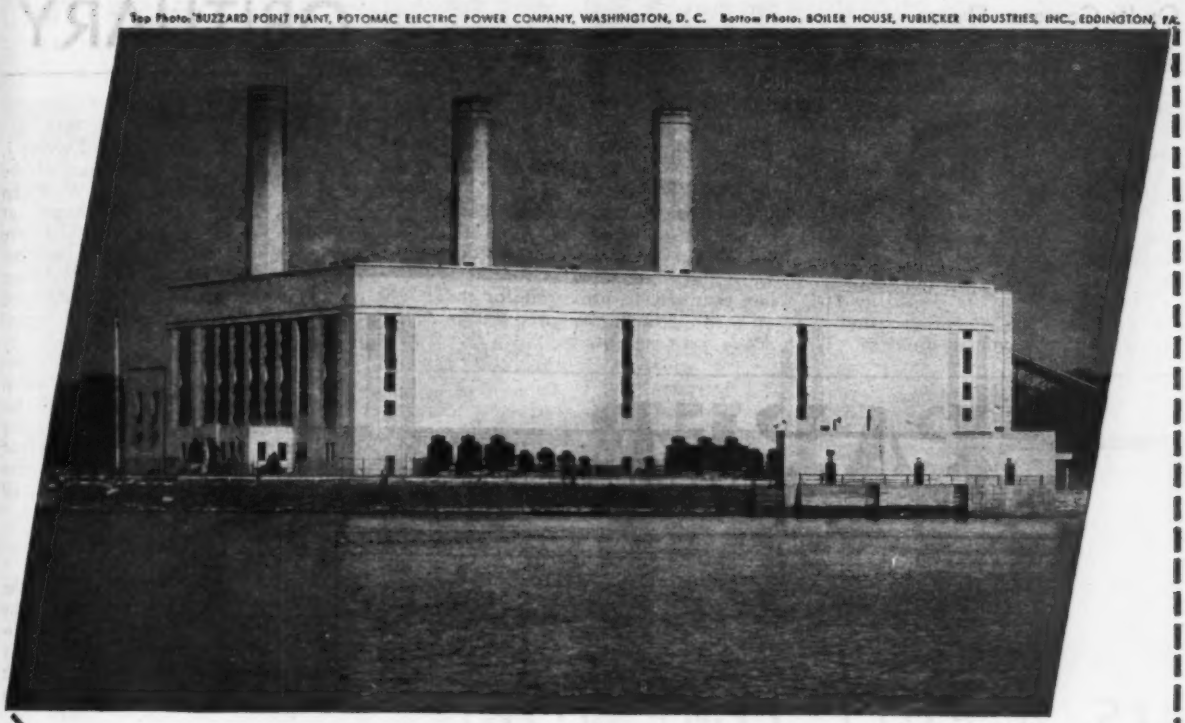
Top Photo: BUZZARD POINT PLANT, POTOMAC ELECTRIC POWER COMPANY, WASHINGTON, D. C. Bottom Photo: BOILER HOUSE, PUBLICKER INDUSTRIES, INC., EDDINGTON, PA.



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Lake St. John Earns $7.64 On Its Common Shares

MONTREAL—Financial statement of the Lake St. John Power & Paper Company Limited, for the year ended December 31, 1946, shows profits of $7.64 per common share after all deductions, including preferred dividend. This compares with $2.02 per common share for the previous year. St. Lawrence Paper Mills Company, Limited, owns 87 per cent of the common stock of the Lake St. John company and all of the preferred stock.

The report, which is signed by J. I. Rankin, president, mentions the increase in the common dividend rate for the first quarter of 1947, to $1.50 per share. It is also noted that the company redeemed and cancelled $1,000,000 of its first mortgage bonds in the year, so that the total funded debt now is $5,999,600.

Despite this paying off of debt and increase in dividend, it is pointed out that the working capital position remains at $3,238,777.

Operating profit was increased substantially, to $2,875,467 from $1,503,064 in the previous year. Deductions were about the same as for the previous year except provision for taxes is up to $1,026,102, compared with $207,266 a year ago.

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OBITUARY

David J. O'Meara

NEW ROCHELLE, N. Y.—David J. O'Meara, sixty-eight, chairman of the board of Walker, Goulard & Plehn Company, Inc., paper merchants, at 450 Pearl Street, New York, died here last week at the Wykagyl Gardens Apartments, 1273 North Avenue. Born in Brooklyn, Mr. O'Meara attended Seton Hall Academy and later joined the paper firm, which was founded by his father, Maurice O'Meara. He became chairman of the board about fifteen years ago. Surviving are his widow, Theresa O'Neill O'Meara; one son, David J. O'Meara jr., and four daughters, Theresa, Ellen and Agnes O'Meara, and Mrs. Martin Snider, all of New Rochelle.

J. Jay Hayes

NEW YORK—J. Jay Hayes, for the past ten years a valued member of the staff of the National Paper Trade Association died suddenly on Sunday morning. He was on his way to church when his heart failed and he died in a few minutes. He was 49 years old.

Jay Hayes had joined the National Paper Trade Association staff in 1937, coming to association work from many years of experience as a salesman for Henry Lindenmeyer and Sons.

He leaves a widow, Helen Durling Hayes. Funeral services and burial were held at St. Mary's Roman Catholic Church, Lee, Mass., on Wednesday.

C. Jackson Booth

OTTAWA—C. Jackson Booth, for many years president of J. R. Booth, Ltd., until it was taken over by the E. B. Eddy Paper Company, died recently at his home here. He was 84 years old, the oldest son of the late J. R. Booth. Of recent years he had confined his interests to the lumber field, as chairman of the Booth Lumber Company at Tee Lake, P. Q.

Gerell Lagerloef

KALAMAZOO, Mich.—Funeral services were held here last week for Gerell Lagerloef who died suddenly at Richland on March 13. He was 38 years old, and was on a trip as western representative for Pagel Horton & Company, New York City. He had joined this firm in May 1945, coming to it from the Pulp and Cellulose Committee of the War Production Board.

Walter I. Harte

LAWRENCE, Mass.—Walter I. Harte, for the past seven years a representative of John W. Bolton & Sons, Inc., recently died here. He was 57 years old and had spent practically his entire life in the paper industry.

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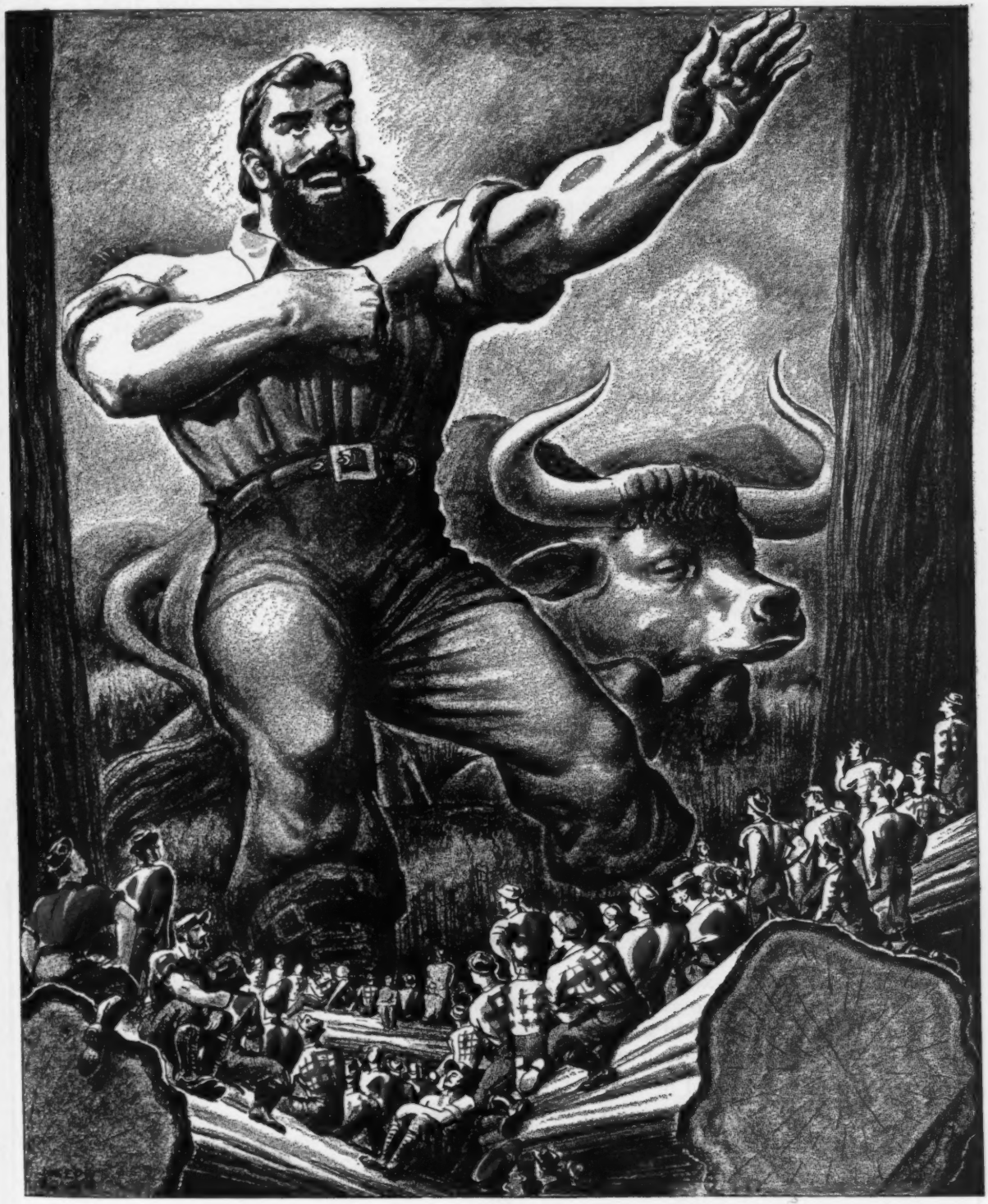

In the early days, Paul Bunyan invented oratory. His pep-talks on the glories of logging once held his loggers spellbound for 8 days, 3 hours and 47 minutes.

A reproduction of this incident from the fabulous life of Paul Bunyan—the sixteenth of a series—will be sent on request. It will contain no advertising.

IMPORTS

NEW YORK IMPORTS

WEEK ENDING MARCH 22, 1947

SUMMARY

Newsprint	4014 rolls
Printing Paper	3 cs.
Wallpaper	5 cs.
Paperhangings	14 lbs., 15 cs.
Writing Paper	1 cs.
Tracing Paper	46 cs.
Tracing Cloth	56 cs.
Drawing Paper	5 cs.
Pith Paper	1 cs.
Tissue Paper	2 cs.
Wafer Paper	9 cs.
Photo Paper	8 cs.
Straw Paper	46 rolls
Straw Board	5557 pkgs.

NEWSPRINT

National City Bank, Stavangerfjord, Stavanger, 620 rolls.

N. Y. Times, Rockliffe Park, St. Johns, N. F., 1664 rolls.

Times Herald (Washington, D. C.), Rockliffe Park, St. Johns, N. F., 1730 rolls.

PRINTING PAPER

National Carloading Co., Fort Miami, London, 3 cs.

WALLPAPER

J. J. Morrow, Sally Maersk, Shanghai, 5 cs.

PAPERHANGINGS

W. H. S. Lloyd & Co., America, Southampton, 14 bls., 2 cs.

W. H. S. Lloyd & Co., Washington, Southampton, 13 cs.

WRITING PAPER

Cartier, Inc., America, Southampton, 1 cs.

TRACING PAPER

E. Dietzgen & Co., St. Valery, Bordeaux, 46 cs.

TRACING CLOTH

Keuffel & Esser Co., Henry Baldwin, Manchester, 56 cs. (bleached cotton).

DRAWING PAPER

Green Kreigsman Paper Co., America, Southampton, 5 cs.

PITH PAPER

American Far Eastern Syndicate, Sally Maersk, Shanghai, 1 cs.

TISSUE PAPER

F. C. Gerlach, Stavangerfjord, Stavanger, 2 cs.

WAFER PAPER

Delft Packing & Trading Co., Westerdam, Rotterdam, 9 cs.

PHOTO PAPER

(———), Henry Baldwin, Liverpool, 8 cs.

STRAW PAPER

Whaling Products Co., Westerdam, Rotterdam, 46 rolls.

STRAW BOARD

Kaufman Co., Westerdam, Rotterdam, 1760 pkgs.

Joe Salwen Paper Products Corp., Westerdam, Rotterdam, 3797 pkgs.

RAGS, BAGGINGS, ETC.

E. Butterworth & Co., Inc., Midland Victory, Antwerp, 87 bls. bagging.

E. Keller Co., Inc., Midland Victory, Antwerp, 225 bls. rags.

A. W. Fenton Co., Fernmoor, Istanbul, 115 bls. old colored cotton rags.

(———), Fort Miami, London, 171 bls. cotton rags.

Riverside Mills, Sally Maersk, Shanghai, 493 bls. cotton waste.

1st National Bank Chicago, Suvorov, Murmansk, 5205 bls. cotton linters.

Amtorg Trading Corp., Suvorov, Murmansk, 629 bls. cotton waste.

National Vulcanized Fiber Co., Henry Baldwin, Manchester, 99 bls. mixed jeans.

"Order of Irving Trust Co.," Henry Baldwin, Manchester, 80 bls. new cuttings.

Amicale Wool Service Co., Inc., Loma Victory, Genoa, 148 bls. cotton rags.

Textile & Paper Supply Co., Loma Victory, Bombay, 100 bls. cotton waste.

Brandwein Mazur Co., Loma Victory, Bombay, 200 bls. cotton waste.

Riverside Mills, Loma Victory, Bombay, 100 bls. cotton waste.

Buffalo Batt & Felt Corp., Loma Victory, Bombay, 230 bls. cotton waste.

Padawer Corp., Loma Victory, Bombay, 100 bls. cotton waste.

(———), Iraq Victory, Alexandria, 71 bls. old bagging.

Textile & Paper Supply Corp., Iraq Victory, Alexandria, 44 bls. cotton waste.

Amicale Wool Service Co., Inc., Iraq Victory, Genoa, 191 bls. old dark cotton rags.

Lecomis United Textile Co., Iraq Victory, Genoa, 19 bls. cotton waste.

NORFOLK IMPORTS

WEEK ENDING MARCH 22, 1947

Darmstadt Scott & Courtney, Midland Victory, Antwerp, 95 bls. old bagging.

BOSTON IMPORTS

WEEK ENDING MARCH 22, 1947

American British Chemical Supplies, Brazilian Prince, Buenos Aires, 1500 bags casein.

Bank of New York, Loma Victory, Genoa, 192 bls. dark cottons.

Leigh Textile Co., Loma Victory, Bombay, 332 bls. cotton waste.

S. L. Ayres & Co., Loma Victory, Bombay, 94 bls. cotton waste.

Green Textile Association, Inc., Iraq Victory, Bombay, 250 bls. cotton waste.

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We believe there is a man who not only knows how to write interesting articles on paper making but who also can pass judgment on articles written by others. We think he is somewhere in the age range 25-35 years and would welcome the chance to join the editorial staff of a publication that is considered a leader in its field.

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TRENDS

Office of the PAPER TRADE JOURNAL,
Wednesday, March 26, 1947.

Production of book, groundwood printing and fine papers continues its steady climb with some integrated mills reporting substantial improvement in delivery dates. Generally, however, unfilled orders remain at high levels and no easing in demand is expected before mid-summer. Capacity production of coarse papers, particularly kraft wrapping paper, is still far from meeting demands. Supplies of paperboard for independent converters are showing some gain but consumers report production gains in folding boxboard interferes with requirements for set-up boxes. Mills, in some instances, are reported offering concessions on high priced bristols, writing and book papers in deals involving large quantities of medium priced papers.

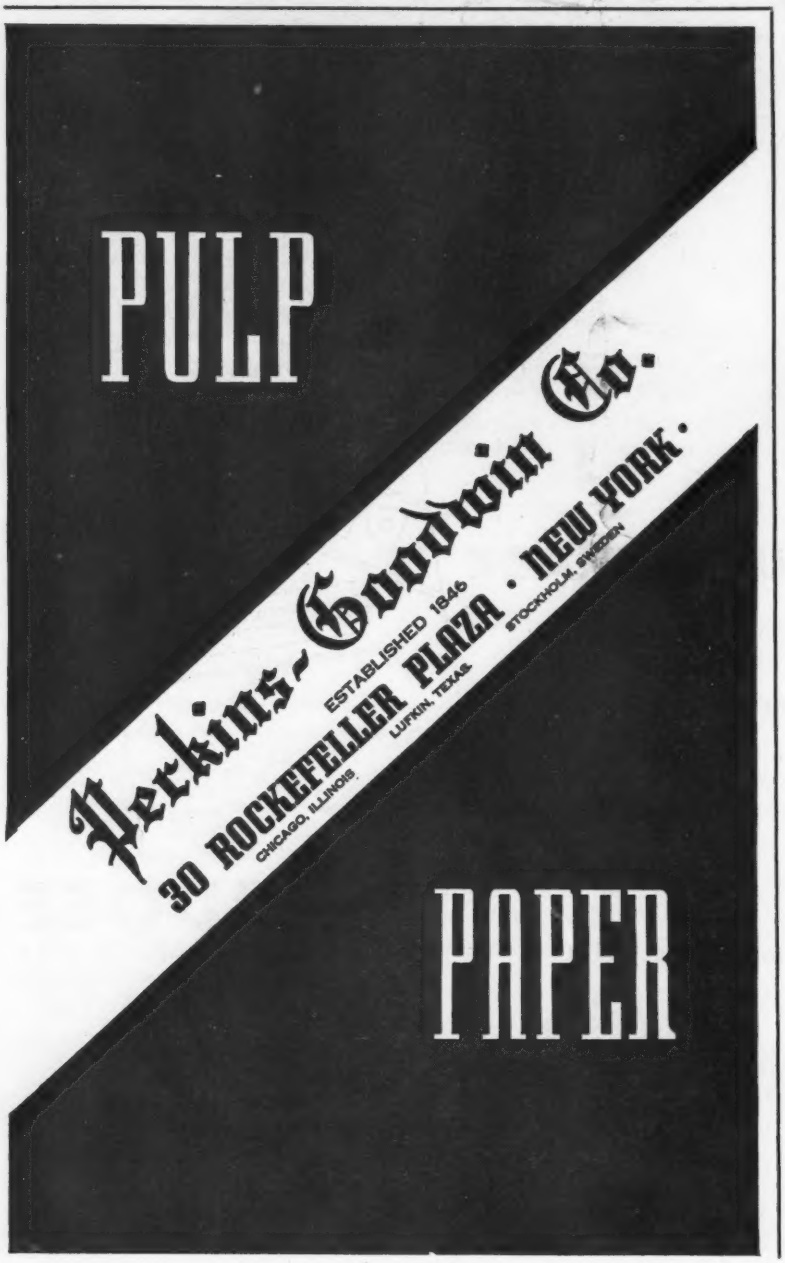
The index of general business activity for the week ended March 15 rose to 146.1 from 144.2 in the previous week, compared with 131.1 for the corresponding week in 1946. The index of paperboard production was 178.6, compared with 178.3 in the preceding week and with 166.1 for the corresponding week in 1946.

Paper production for the week ended March 15 was estimated at 106.1 percent, compared with 104.5 for the preceding week, with 104.1 for the corresponding week in 1946, with 89.4 for 1945, with 92.2 for 1944, and with 88.0 percent for the corresponding week in 1943.

Paperboard production for the week ended March 15 was 104.0 percent of capacity, compared with 102.0 percent for the preceding week, with 100.0 percent for the corresponding week in 1946, with 95.0 for 1945, with 95.0 for 1944, and with 92.0 percent for the corresponding week in 1943.

Pulpwood is piling up in Northeastern woods because of the freight car shortage. Pulpwood is usually hauled out of the woods during the winter months and loaded on railroad cars at country sidings for movement to paper mills. Due to the prevailing car shortage in New England, available ground storage adjacent to side tracks is piled high with pulpwood awaiting cars; while sizeable quantities are still in the woods where it must remain until next year unless prior to spring thaws, there is substantial improvement in the car situation. Ultimately the rehandling of this wood from storage lots to cars will increase the cost $1.50 to $1.75 per cord. Many paper and pulp mills in this area report they are able to obtain only 35 percent, or less, of the cars necessary to take care of the seasonable movement of pulpwood. Unless this situation is immediately corrected pulpwood supplies may be so reduced as to prohibit meeting the demands of converting paper mills dependent upon an open pulpwood market.

Plans are being developed for the manufacture in Mexico of about 350,000 tons of paper annually from sugar cane bagasse, formerly a waste product, according to the Mexican Chamber of Commerce. A plant is to be constructed near Zacatepec with actual production of 20 tons a day expected by the end of 1947. Eventually it is expected that a chain of paper mills will be established throughout the country to attain the 350,000 ton annual goal. A Mexican financier is said to be behind the project. . . . Sweden exported 121,000 tons of newsprint during 1946 as against 176,000 tons in 1939. Exports of sulphate wrapping paper from Sweden amounted to 142,000 tons compared with 156,000 tons in 1939. Sulphite wrapping paper exports from Sweden were 56,000 tons compared with 104,000 tons in 1939. Swedish exports of cardboard were considerably lower in 1946, while exports of wood fiber plates increased from 43,000 tons in 1939 to 69,000 tons



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in 1946. . . . Exports of wood pulp, cellulose and paper from Norway totaled over 530,000 tons in 1946. This figure includes 165,000 tons of wood pulp, 85,000 tons of chemical pulp and 280,000 tons of paper.

Wood Pulp

Recent action by the Swedish government to restrict imports on all except essential commodities and to step up exports, particularly woodpulp and newsprint, was made to combat that country's inflation threat and to halt the rapid decline in Sweden's foreign exchange reserves.

Trade sources now believe that Sweden will be able to increase wood pulp exports by 10 to 15 percent when heavy rationing is imposed on the domestic (Swedish) market. The United States may thus expect to get considerably more wood pulp from Sweden this year. Currently Sweden is producing pulp at an annual rate of 2,300,000 tons, but once the shortage of coal and labor has been overcome production is expected to reach 2,650,000 tons. Indications now point up the possibility of Sweden sending us over 800,000 tons of pulp in 1947.

Rags

Miscellaneous thirds and blues continue to dominate a fairly active market for old domestic cotton rags at $2.50 per 100 pounds f.o.b. shipping point plus dealer's commission. Repacked thirds and blues are currently $3. No. 1 whites repacked remain $5.

Medium light prints at $5.25 to $5.75 were active this week in the old foreign cotton rag market. Checks and blues are currently quoted around $4.20; dark cottons at $3.75 to $4 and old shopperies $3.25 to $3.50.

Old Rope and Bagging

Market for old rope remains unchanged. Domestic Manila rope stays at $5.75 per 100 pounds f.o.b. New York. Jute strings $4.50 to $5 and No. 1 sisal strings $4 to $4.50. Mixed strings are currently $1.75.

Domestic No. 1 gunny tops the bagging market at $4.25 to $4.50 to paper mills f.o.b. New York. Light wool tares are actively quoted at close to $4.75, and $5 for the heavy stuff. Bright bagging is currently $4.50.

Waste Paper

Paper mills still show a very active interest in all high grades of waste paper. No. 1 hard white envelope cuts, one cut, are strong at $120 and up. New Manila envelope cuttings, one cut, maintains its $110 position. White blank news stays around $80. Kraft envelope cuttings are still $105 and No. 1 white ledgers are quoted at $80.

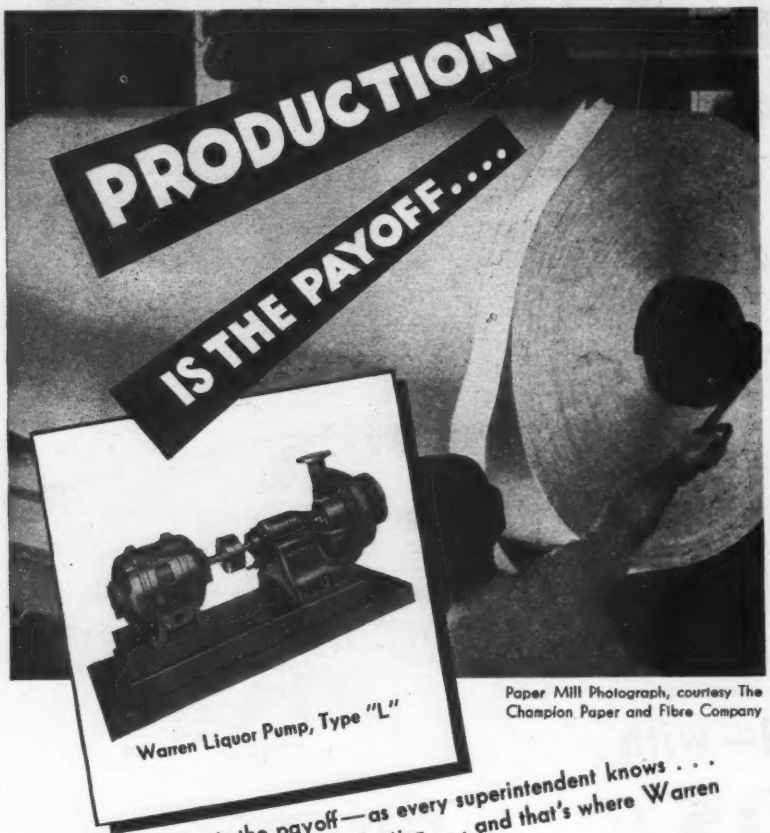
F. C. Huyck Honors Braman

Several hundred employes of the Rensselaer mills of F. C. Huyck & Sons, serving longer than twenty-five years, were guests of the firm at a banquet during which James L. Braman, chairman of the board of directors, received individual honors for 34 years of uninterrupted service. Certificates of merit were awarded to 19 employes who have completed 25 years or more with the company.

Murco Agitator Designed For Large Stock Chests

WAUSAU, Wis. — The new "Murco" flow axial agitator for vertical flow applications, for agitating and mixing paper stock or material in suspension has been designed especially for stock chests circular in shape of comparatively large diameter and low height, or small diameter and great height. The agitator is mounted vertically within a tube located concentrically in the chest.

The impeller is designed in sizes from 24 to 72 inches with capacity to move from 3000 to 20,000 gallons per minute. This agitator is furnished complete with draft tube, baffle if required, and V-belt drive. The agitator shaft may be direct-connected to vertical gear head motor, flat or V-belt driven to meet plant requirements. Complete details will be furnished by the manufacturer, D. J. Murray Manufacturing Company, Wausau.



Paper Mill Photograph, courtesy The Champion Paper and Fibre Company

Production is the payoff—as every superintendent knows . . . quality and quantity production . . . and that's where Warren Pumps really pay off.

Warren offers a specially engineered pump for practically every application . . . for handling pulp stocks, liquors in sulphite, soda and Kraft mills, water for mill supply, showers, white water, wash-down, etc., for boiler feed and all power plant requirements.

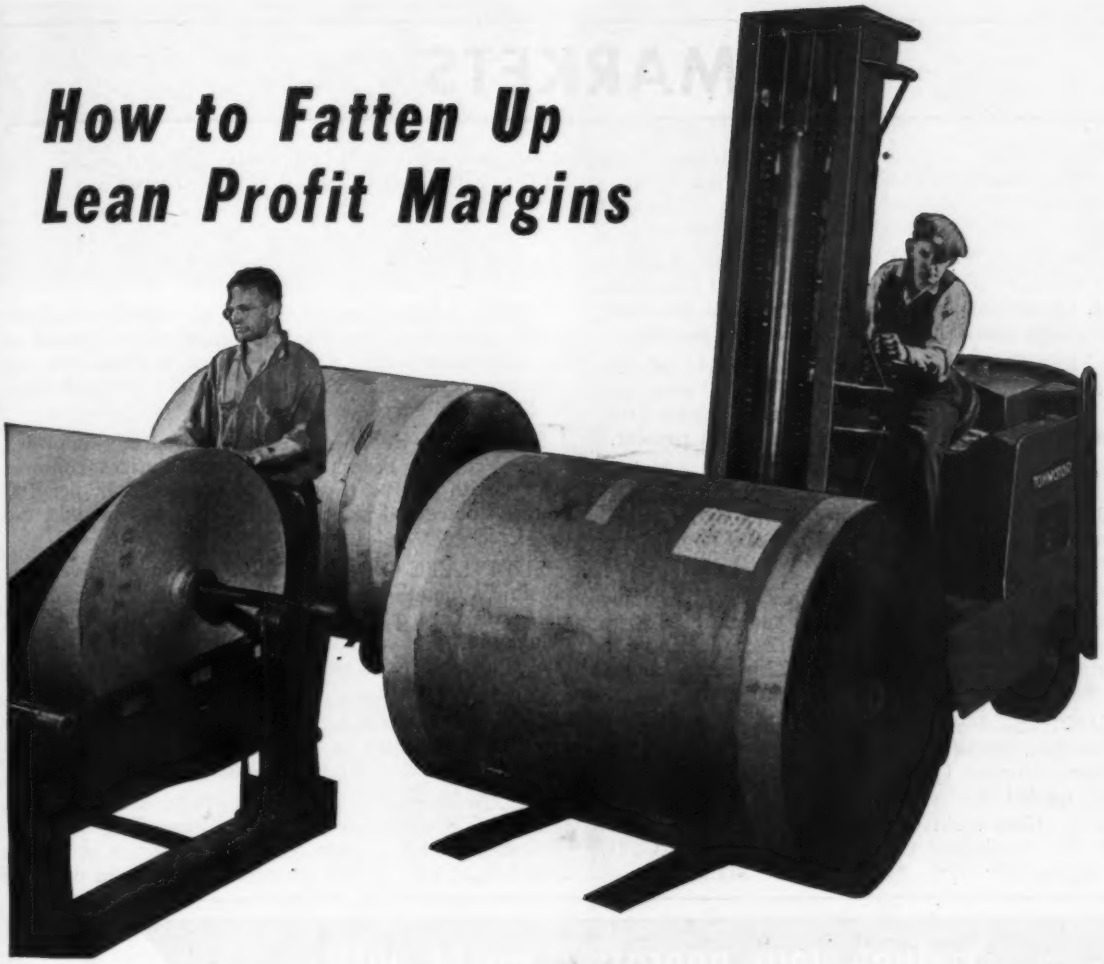
For Greater Dependability . . . Longer Life . . . Lower Maintenance . . . all important factors in PRODUCTION . . . the PAYOFF . . . Specify:

PP-61

WARREN PUMPS

WARREN STEAM PUMP COMPANY, INC., WARREN, MASS.

How to Fatten Up Lean Profit Margins



WHATEVER YOUR PRODUCT, handling is an added cost that reduces the margin of profit . . . and the cost of handling is determined by the method of handling.

Modern handling methods mean lower handling costs—and elimination of production delays, reduced accident rates and less product damage. Modern handling methods call for Towmotor Fork Lift Trucks and Accessories—designed for fast, systematic movement of materials and products in receiving, processing, storage and distribution.

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TOWMOTOR THE ONE-MAN-BANK **FORK LIFT TRUCKS *and* TRACTORS**

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MARKETS

BLANC FIXE—Supply steadier as deliveries show some improvement. Demand continues active. Pulp is currently quoted at $55 per ton, in barrels, car lots, at works; the powder is quoted at $67.50 per ton car lots.

BLEACHING POWDER—Most current demands are met through adequate supplies. Shipments sometimes delayed. Quotations are unchanged. Prices on bleaching powder range from $2.65 to $3.35 per 100 pounds.

CASEIN—Current prices on processed acid precipitated casein are reported around 37 to 43 cents per pound for both domestic and Argentine grades f.o.b. shipping point, with quantity not specified at present.

CAUSTIC SODA—Shipments are behind schedule. Cut-back production further reduces stocks. Solid caustic soda is reported at $2.50 per 100 pounds; flaked and ground offered at $2.90 to $3 per 100 pounds, car lots, at works.

CHINA CLAY—Demand continues heavy as supply remains tight. Domestic filler clay is currently $8.50 to $9 per ton, car lots. Coating clay is $12 car lot and $16 less car lot. Imported clay is $20 to $22 per ton, car lot, export warehouse; and $45 less car lot for powdered.

CHLORINE—Market tight as demand continues to exceed output, stocks low. Lack of tank cars continues to hamper deliveries. Quotations unchanged. Chlorine is currently quoted at $2 to $2.25 per 100 pounds.

ROSIN—Gum rosin in drums, per 100 pounds net, in yard New York, car lots, B, D, $10.80; E, F, G, H, I, K, M, $11.50; WG, $11.75; WW, $11.75; Wood Rosin, per 100 pounds l.c.l., f.o.b. N. Y., B, $7.45; FF, $8.95; G, H, I, $10.25; WW and X, $10.45.

SALT CAKE—Demand continues to increase with supplies showing little improvement. Prices remain unchanged. Domestic salt cake is quoted at $22 to $24 per ton in bulk. Chrome salt cake is quoted at $16 per ton.

SODA ASH—Demand active as supplies continue short, previous orders filled. Contract orders prevail at the same high levels. Current prices, car lots, per 100 pounds, are as follows: in bulk, $1.05; in paper bags, $1.20; and in barrels, $1.60.

STARCH — Supplies are showing steady improvement. Previous orders filled. Starch prices continue strong with the pearl grade quoted at $4.37 per 100 pounds; powdered starch at $4.48 per 100 pounds, car lots, Chicago.

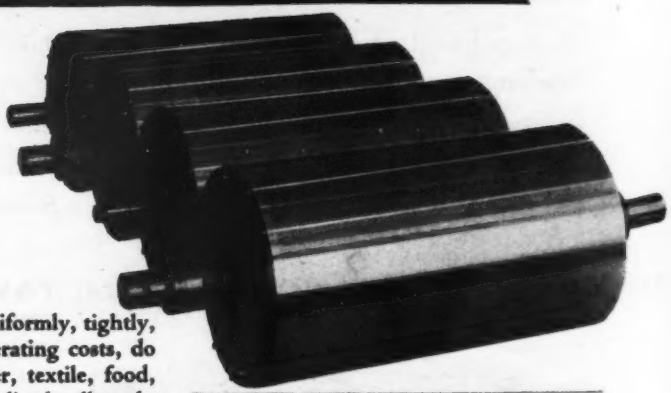
SULPHATE OF ALUMINA—Demand active, supply fair. Quotations continue unchanged. The commercial grades are quoted at from $1.15 to $1.20 per 100 pounds, in bags, car lots, f.o.b. works. The iron free is quoted at $1.75 to $2 per 100 pounds, in bags, at works.

SULPHUR — Strong seasonal demand is reported with stocks plentiful to meet all requirements. Annual contracts are quoted at $16 per long ton, f.o.b. mines; the price f.o.b. at Gulf Ports is $17.50 per long ton.

TALC—Domestic and French grades are moving in fair volume with prices steady. Domestic grades are currently quoted at from $16 to $30 per ton at mines; Canadian at $35 to $45 per ton. All prices in car lots.

reduce your operating costs with

WELDCO *Covered Rolls*



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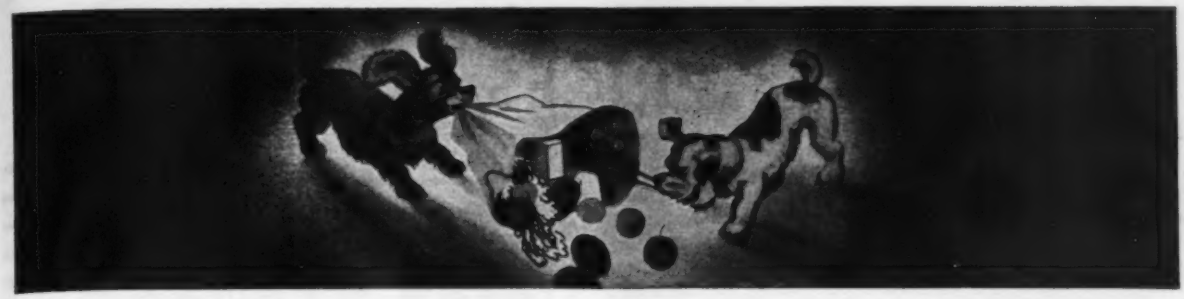

P-426 BECKAMINE

makes paper super-resistant to moisture and stress

Easy to use—and sure in its results—P-426 Beckamine is rapidly becoming the favored wet-strength resin. Applied in the beater, fan pump or directly to the sheet in the size press, this exceptionally stable urea-formaldehyde resin heightens tensile strength, fold, and Mullen, in addition to making paper super-resistant to dampness. For diapers, field maps, paper bags—any paper product subjected to moisture and stress—P-426 Beckamine is a "must". For details write direct to the Sales Department at Detroit.

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SYNTHETIC RESINS • CHEMICAL COLORS • PHENOLIC PLASTICS • INDUSTRIAL CHEMICALS

PRICES

With the elimination of price controls on paper, pulp, rags and other materials, the quotations given below once more become indicative of trends in an open market. At the moment they can be of little more, for, while some volume of business still is being done under contract at the figures given below, fluctuations representing special conditions are too varied and too frequent to permit prices to be given as representing a wholly stabilized market.

Paper

(Delivered New York)

Standard News, per ton—

Roll, contract	$84.00	@	—
Sheets	103.00	"	—

Kraft—per cwt.—Carload Quantities
Zone A, Delivered
40 lb. base weight

Superstandard Wrapping	$6.25	@	$6.50
No. 1 Wrapping.	6.00	"	6.25
Standard Wrapping	5.25	"	6.00
Standard Bag	5.25	"	6.00

Tissues—Per Ream 24x36 (480) 10 lb. Zone 1.

Wh. No. 1 Frd.	1.10	@	1.20
Wh. No. 1 M. G.	1.10	@	1.20
Wh. No. 1½	.95	@	1.10
Wh. No. 2	1.00	@	1.10
Wh. Anti-Tar.	2.25	@	3.50
Kraft Unbl.	1.15	@	1.25
Manila No. 2	.90	@	1.05

Toilet—Per Case of 100 rolls 1 M Sheets.

Unbleached	4.47	@	5.50
Bleached	6.50	"	—

Paper Towels — Per Case of 3750 Zone 1.

Wh. C. fold 11x13¼	4.09	@	—
Br. Sgl. fold 10 in.	2.37	"	2.48
Br. M'tif'd 9½x14¾	3.48	"	—
Br. M'tif'd 9½x9¾	2.37	"	2.48

Manila—per cwt.—C. l. f. a.

No. 1 Jute	11.25	@	—
No. 1 Manila 35 lb.	6.00	"	7.00

Boards, per ton—

News	*75.00	@	81.50
Chip	*73.00	"	77.50
Sgl. Mla. L1 Chip	*89.00	"	92.50
White Pat. Coated	*101.50	"	110.00
Kraft Liners 42 lb.	*84.00	"	100.00
Binders Boards	94.00	"	126.00

Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices, all deliveries in Zone 1:

Rag Content Bonds and Ledgers—White, Assorted Items

	Bonds		Ledgers
100% Rag Ext. No. 1	$39.75 @	$46.75	$40.90 @ $48.00
100% Rag.	32.85 "	38.50	34.00 " 40.00
85% Rag	.... "	....	30.55 " 38.75
75% Rag	24.30 "	28.50	24.45 " 30.00
65% Rag	.... "	....	.... " ....
50% Rag	20.05 "	24.50	21.25 " 25.75
25% Rag	17.85 "	21.75	19.00 " 23.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers.. White, Assorted Items

	Bonds		Ledgers
No. 1	$12.00 @	$14.50	$13.15 @ $16.00
No. 2	11.25 "	13.75	12.25 " 15.00
No. 3	.... "	....	.... " ....
No. 4	10.60 "	13.00	11.75 " 14.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper

No. 1 Glossy Coated..	$14.70 @		$16.75
No. 2 Glossy Coated..	13.75 "		15.50
No. 3 Glossy Coated..	13.20 "		16.00
No. 4 Glossy Coated..	12.80 "		14.50
No. 1 Antique (Watermarked)	11.35 "		12.75
No. 2 Offset	10.65 "		12.25
A Grade E. F.	10.60 "		12.00
A Grade S. & S. C.	11.00 "		12.50
B Grade E. F.	10.30 "		11.75
B Grade S. C.	10.70 "		12.25
C Grade E. F.	10.00 "		11.50
C Grade S. C.	10.40 "		12.00
D Grade E. F.	9.70 "		11.00
D Grade S. & S. C.	10.10 "		11.50

Ivory & India at $.50 cwt. extra.

Wood Pulp

Domestic mill prices delivered with former OPA freight allowances.

	Per Short ADT		
Groundwood	$75.00	to	—
Unbleached Sulphite	105.00	"	—
Bleached Sulphite	115.00	"	122.50
Bleached Soda	105.00	"	115.00
Unbleached Kraft	102.50	"	—
Southern Kraft	90.00	"	102.50

Canadian mill prices delivered with freight allowances of $7.50 per ADT; unless otherwise specified:

	Per Short ADT		
Regular Kraft	$102.50	to	—
Select Unbleached Kraft (no freight allowance)	105.00	"	—
Unbleached Sulphite	105.00	"	—
Glassine Unbleached Sulphite (no freight allowance)	102.50	"	—
Bleached Soda	105.00	"	115.00
Groundwood	75.00	"	80.00
Sideruns Pulping News	75.00	"	—
Hardwood and Specialty Grades	Nominal		

Swedish wood pulp prices, per ton of 2,000 lbs. air dry weight on dock usual Atlantic and Gulf ports with an average freight cost of about $9.00 per short ton included. Subject to change as it is said these prices are not satisfactory to Swedish producers:

	Per Short ADT
Bleached Sulphite	$120.00
Bleached Kraft	126.00
Unbleached Sulphite	95.00
Unbleached Kraft	89.00

Finnish quotations ex. dock, New York

	Per Short ADT
Bleached Sulphite	$165.00
Unbleached Sulphite	132.50
Unbleached Sulphite (special grade)	137.50
Unbleached Sulphate	132.50
Unbleached Sulphate (special grade)	159.00

Other European countries, at the present time, are not quoting on prompt and forward deliveries of wood pulp, because they have no tonnage available for export.

New Domestic Cotton Cuttings

(Prices delivered Mill Plus Dealer's Commission)

White Shirt	$11.50	to	$12.00
Light Silesias			7.50
Unbleached Muslin	11.50	"	12.00
White Back Blue Overalls			8.25
Blue Overalls			7.75
Unbl. Fancy Shirt	4.50	"	5.00
Light Percales	5.50	"	6.00
Light Prints	5.25	"	5.95
Washables			4.00
Bleachable Khaki	5.50	"	6.00
Unbleachable Khaki	5.00	"	5.50
Cottonades	4.50	"	5.00

Old Domestic Cotton Rags

(F.O.B. Shipping Point Plus Dealer's Commission)

	Per 100 lbs.
No. 1 Whites Repacked	$5.00
No. 1 Whites Miscellaneous	4.25
No. 2 Whites Repacked	4.00
No. 2 Whites Miscellaneous	3.50
Blue Overalls	3.75
Thirds and Blues Repacked	3.00
Thirds and Blues Miscellaneous	2.50
No. 1 Roofing Rags	2.20
No. 2 Roofing Rags	2.10
No. 3 Jute Bagging	2.00
No. 4 Brussels and hard back carpets	2.00
No. 5A Roofing Rags	2.00

New Foreign Cotton Cuttings

(Prices delivered Mill)

	Per 100 lbs.		
New Dark Cuttings	$6.00	to	....
New Mixed Cuttings	6.50	"	....
Light Silesias	9.00	"	10.00
Light Flannelettes	8.00	"	9.00
New White Cuttings	13.00	"	15.00
Fancy Shirt Cuttings	9.00	"	10.00
Light Prints	8.00	"	10.00
Bleachable Khaki, No. 1	7.00	"	7.50
Unbl. Khaki, No. 1	6.25	"	6.75

Old Foreign Rags

(F.O.B. New York)

	Per 100 lbs.		
No. 1 White Linens	$14.00	to	16.00
No. 2 White Linens	12.00	"	13.00
No. 3 White Linens	8.00	"	9.00
No. 4 White Linens	8.00	"	9.00
No. 1 White Cottons	10.00	"	12.00
No. 2 White Cottons	8.00	"	9.00
No. 3 White Cottons	6.50	"	7.00
No. 4 White Cottons	5.00	"	5.50
Extra Light Prints	7.50	"	8.00
No. 1 New Light Prints	6.25	"	6.75
Med. Light Prints	5.25	"	5.75
Dutch Blue Cottons	5.25	"	5.50
Checks and Blues	4.00	"	4.25
Linsey Garments	4.50	"	5.00
Dark Cottons	3.75	"	4.00
Old Shopperies	3.25	"	3.50
New Shopperies	3.25	"	3.50

BAGGING

(Prices to Mill, f.o.b. N. Y.)

	Per 100 lbs.		
Foreign Gunny, No. 1	$4.75	to	5.00
Domestic Gunny, No. 1	4.25	"	4.50
Light Wool Tares	4.50	"	4.75
Heavy Wool Tares	4.75	"	5.00
Bright Bagging	4.25	"	4.50
Foreign Manila Rope	6.00	"	7.00
Domestic Manila Rope	5.75	"	...
Jute Strings	4.50	"	5.00
No. 1 Sisal Strings	4.00	"	4.50
Mixed Strings	1.75	"	...

Waste Paper

Prices to Mills
(Dollars Per Ton)
F.o.b. New York, Baled

No. 1 Hard White Envelope Cuts, one cut	$100.00	@	$120.00
No. 1 Hard White Envelope Cuts	90.00	"	100.00
No. 1 Hard White Shavings, unruled	100.00	"	110.00
No. 1 Hard White Shavings, ruled	80.00	"	90.00
Soft White Shavings, one cut	95.00	"	105.00
No. 1 Soft White Shavings	85.00	"	95.00
Soft White Shavings, Misc.	65.00	"	75.00
No. 1 Fly Leaf Shavings	55.00	"	60.00
No. 2 Fly Leaf Shavings	50.00	"	55.00
No. 1 Groundwood Fly Leaf Shavings	30.00	"	33.00
No. 2 Mixed Groundwood Fly Leaf Shavings	(nominal)		
Mixed Colored Shavings	(nominal)		
Mixed Groundwood Colored Shavings	(nominal)		
Overissue Magazines	(nominal)		
No. 1 Heavy Books & Magazines	40.00	"	45.00
Mixed Books	22.00	"	25.00
No. 1 White Ledger	70.00	"	80.00
No. 2 Mixed Ledger, colored	60.00	"	70.00
New Manila Envelope Cuttings, one cut	100.00	"	110.00
New Manila Envelope Cuttings	65.00	"	75.00
Extra Manilas	40.00	"	45.00
Mixed Kraft, Env. & Bag Cuttings	75.00	"	85.00
Kraft Envelope Cuttings	100.00	"	105.00
Triple Sorted, No. 1 Brown Soft Kraft	70.00	"	75.00
New 100% Kraft Corrugated Cuttings	70.00	"	75.00
No. 1 Assorted Old Kraft	40.00	"	50.00
New Jute Corrugated Cuttings	27.00	"	—
Old 100% Kraft Corrugated Containers	(nominal)		
No. 1 News	26.00	"	27.00
No. 1 Mixed Paper	19.00	"	21.00
Box Board Cuttings	23.00	"	—
White Blank News	75.00	"	80.00
Overissue News	(nominal)		
Old Corrugated	28.00	"	30.00
Mill Wrappers	22.00	"	25.00

Twines

All Prices Nominal
(F. o. b. Mill)
(Soft Fiber)

Coarse Polished—India	.26	@	.29
Fine Polished—Fine India	.31	"	.35
Unpolished—			
Paper Makers	.20	"	.26
Tube Rope	.22	"	.27½
Wrapping	.26	"	.33½
Cotton	.70	"	—
(Hard Fiber)			
Mex. Sisal	.21	"	.24
Manila	.33	"	—
(Hemp)			
Polished Hemp	.63	"	—

PHILADELPHIA

Domestic Rags (New)

(F.O.B. Eastern Shipping Point)

Shirt Cuttings—			
New White No. 1	.10½	@	.11
New White No. 2	nominal		
Light Silesias	.07½	"	.08
Black Silesias, soft	.06½	"	.07
New Unbleached	.10½	"	.11¼
Washable Prints	.06½	"	.07
Washable No. 1	.05	"	.05½
Blue Overall	.07½	"	.08
Cottons—According to grades—			
Washable Shredding	.03½	"	.04
Fancy Percales	.06¾	"	.07¼
New Black Soft	nominal		
Khaki Cuttings—			
Unbleachable Cotton Cuttings	.05½	"	.06
Bleachable Cotton Cuttings	.06½	"	.07
Men's Corduroy	.05½	"	.06
Ladies' Corduroy	.05	"	.05½
Cottonades	.05½	"	.06

Domestic Rags (Old)

(F.O.B. Eastern Shipping Point)

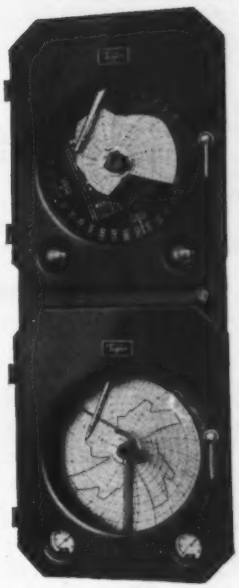
White No. 1—Repacked	4.50	"	5.00
Mixed White	4.00	"	4.25
White No. 2—Repacked	3.50	"	3.75
Thirds and Blues—			
Miscellaneous	2.25	"	2.50
Repacked	2.75	"	3.00
Roofing Stock—			
Foreign No. 1	nominal		
Domestic No. 1	2.00	"	2.05
Domestic No. 2	1.90	"	1.95
Roofing Bagging	1.90	"	1.95
Old Manila Rope	5.75	"	6.00

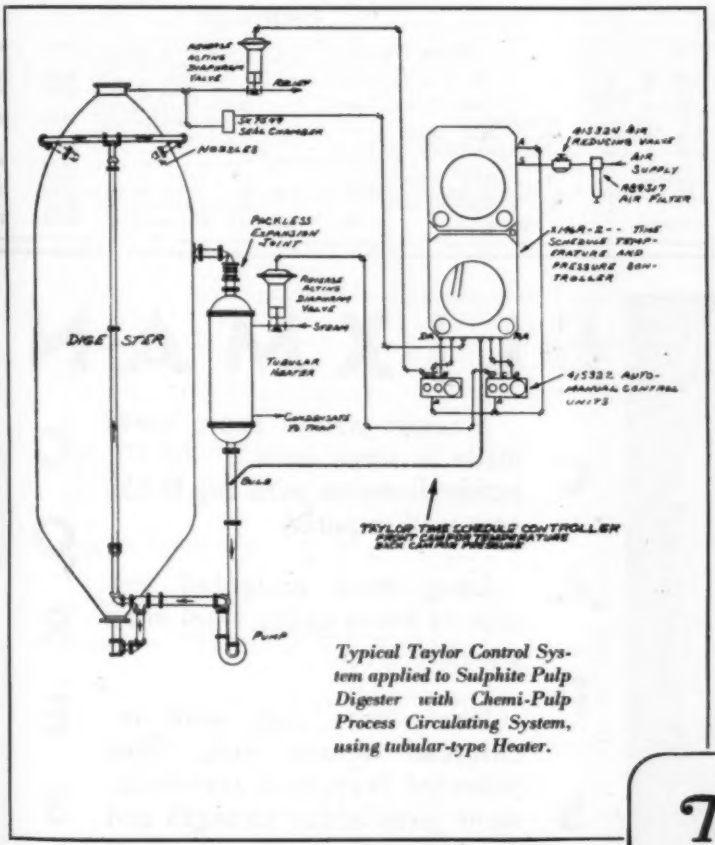
Bagging

(F.O.B. Eastern Shipping Point)

Gunny No. 1—Foreign	nominal		
Domestic	4.25	@	4.50
No. 1 Clean Bright—Sisal Strings	.04	"	.04½
No. 2 Clean Bright—Sisal Strings	.03	"	.03½
Sisal Jute	.02¾	"	.03
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.85

FOR PULP DIGESTING I'M A GLUTTON— JUST CUT THE CAMS AND PUSH A BUTTON!





Typical Taylor Control System applied to Sulphite Pulp Digester with Chemi-Pulp Process Circulating System, using tubular-type Heater.

NO, we're not fooling. That's just how easy it is to control your sulphite pulp digester with a Taylor Fulscope Time Schedule Controller!

With hand controlled cooking it's hard to make one batch of pulp come out exactly like another. But with this Fulscope on the job you can *automatically* reproduce your ideal cooking schedule time and time again. It greatly simplifies the complicated job of keeping temperatures and pressures under accurate control.

After the ideal cooking schedule has been determined, a cam is cut which automatically adjusts the control point. All the operator has to do is set the cams and push a button—the Taylor Time Schedule Controller does the rest. And it does the same thing in the same way every time!

During the past 14 years more and more pulp and paper mills have profited from time-proven Taylor Control Systems like this one. We'd like to help you with *your* processing problems. Call your Taylor Field Engineer, or write Taylor Instrument Companies, Rochester, New York, or Toronto, Canada.

Instruments for indicating, recording and controlling temperature, pressure, humidity, flow and liquid level.

Taylor Instruments
MEAN
ACCURACY FIRST
IN HOME AND INDUSTRY

Wool Tares, heavy	4.00	"	4.25
New Burlap Cuttings	6.00	"	6.50

Old Papers

(F. o. b. Phila.)

Mill Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	$100.00	@	$115.00
No. 1 Hard White Shavings, unruled	100.00	"	—
Soft White Shavings, one cut	90.00	"	95.00
White Blank News	60.00	"	65.00
Soft White Shavings	80.00	"	—
No. 1 White Ledger	75.00	"	80.00
Ledger, colored	60.00	"	65.00
No. 1 Heavy Books & Magazines	40.00	"	45.00
Overissue Magazines	nominal		
New Manila Envelope Cuttings	80.00	"	—
No. 1 Assorted Old Kraft	60.00	"	65.00
No. 1 Mixed Paper	20.00	"	—
Box Board Cuttings	20.00	"	—
Kraft Corrugated Cuttings	nominal		
Old Corrugated	30.00	"	35.00
Overissue News	40.00	"	—
No. 1 News	—	"	30.00

BOSTON

Old Papers

(F. o. b. Boston)

Mill Prices, Baled

No. 1 Hard White Shavings, unruled	7.00	@	8.00
No. 1 Hard White Shavings, ruled	7.00	"	8.00
Soft White Shavings, Mis.	6.25	"	6.50
No. 1 Fly Leaf Shavings	1.65	"	1.80
No. 2 Fly Leaf Shavings	2.00	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	1.25	"	1.50
Mixed Colored Shavings	2.50	"	2.75
New Manila Envelope Cuts, one cut	5.00	"	5.50
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	3.50	"	3.75
Mixed Kraft Env. & Bag Cuttings	3.75	"	4.00
Kraft Envelope Cuttings	3.75	"	4.00
No. 1 Heavy Books & Magazines	2.50	"	2.60
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	4.25	"	4.50
Groundwood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	3.50	"	—
No. 1 Mixed Paper	—	"	.95
Overissue News	1.50	"	1.75
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.50	"	—
Jute Corrugated Cuttings	1.07½	"	—
Paper Strings	2.25	"	2.50

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	5.00	@	—
Domestic	5.00	"	5.12½
Sisal Rope No. 1	6.00	"	—
Sisal Rope No. 2	5.50	"	—
Mixed Rope	5.25	"	—
Mixed Strings	2.00	"	2.50
Transmission Rope—			
Foreign	(nominal)		
Domestic	3.00	"	3.50
Manila Rope—			
Foreign	(nominal)		
Domestic	6.25	"	—
Soft Jute Rope	5.00	"	5.25
Jute Carpet Threads	6.00	"	—
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	4.75	"	5.00
Domestic	5.00	"	5.25
South America	5.25	"	—
Wool Tares—			
Foreign	4.50	"	—
Domestic	4.50	"	—
Aust. Wool Pouches	5.00	"	5.25
New Zealand Wool Pouches	5.25	"	5.50
New Burlap Cuttings	6.00	"	6.50
Heavy Baling Bagging	5.25	"	5.75
Paper Mill Bagging	3.50	"	3.75
No. 1 Roofing Bagging	1.75	"	—

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.07	@	.07½
Fancy Percales	.07½	"	.08
New White No. 1	.10	"	.11
New Light Flannelettes	.08	"	.08½
Canton Flannels, Bleached	.10	"	.11
Underwear Cutters, Bleached	.10	"	.11
Underwear Cutters, Unbleached	.11	"	.12
Silesias No. 1	.07	"	.08
New Black Silesias	.05	"	—
Red Cotton Cuttings	.05	"	—
Soft Unbleached	.11	"	.12
Blue Cheviots	.07½	"	.08
Fancy	.06	"	—
Washable	.09	"	—
Khaki Cuttings	.06	"	.07
O. D. Khaki	.07	"	—
Corduroy	.03½	"	—
New Canvas	.06¼	"	.06¼
B. V. D. Cuttings	.10	"	.11

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.40	@	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	2.00	"	—
No. 2	1.90	"	2.00
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.20	"	—
Quality C	.95	"	—
Old Manila Rope	6.00	"	—

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

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No. 1 Hard White Envelope Cuts, one cut	$110.00	@	$120.00
No. 1 Hard White Shavings, unruled	105.00	"	115.00
No. 1 Soft White Shavings	80.00	"	95.00
No. 1 White Ledger	55.00	"	65.00
No. 1 Heavy Books & Magazines	40.00	"	42.00
White Blank News	43.00	"	49.00
Mixed Kraft Env. & Bag Cuttings	75.00	"	85.00
No. 1 Assorted Old Kraft	45.00	"	55.00
Overissue News	38.00	"	42.00
No. 1 News	30.00	"	—
No. 1 Mixed Paper	19.00	"	20.00
Old Corrugated	33.00	"	—
Mill Wrappers	25.00	"	29.00

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IN PART

We are emerging from the first phase of postwar living and obviously there is a big job to do. We have emerged with new products being developed—all sorts of new and substitute materials. Setting aside for the moment that most momentous of all new developments—atomic energy with all it can mean for peacetime industry—we have at hand today, the technical knowledge that can be used in the development of a vast number of new materials and new devices.

We have emerged with metals like aluminum and magnesium in new quantities. We have destroyed old monopolies and changed the channels of world trade. The future of world distribution and marketing will be as different as domestic distribution. The only question is whether or not we have emerged with fresh thinking. —*Albert J. Browning, vice-president, Ford Motor Company, speaking before the Chamber of Commerce of the United States.*

It is a delightful experience to be home again and back in a paper mill. I like the smell of newly made paper. I have not whiffed any odor in any part of the world that I like any better. I am delighted to be back in this group again, and I hope to take my place beside you in fighting for better human relations, better standards of qualitiy, and better methods of distribution in the industry, because we really have a great industry and it is worth fighting for.—*Thomas B. McCabe, President of the Scott Paper Company, speaking before the Tissue Industry Meeting, February 25, 1947.*

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1947		Corresponding Weeks—1946	
February 8	106.2	February 9	99.7
February 15	104.5	February 16	95.0
February 22	105.9	February 23	98.0
March 1	108.5	March 2	101.8
March 8	104.5	March 9	103.4
March 15	*106.1*	March 16	104.1

COMPARATIVE MONTHLY SUMMARIES

1946						1947	
Jan.	94.7	May	100.7	Oct.	106.4		
Feb.	98.4	June	104.6	Nov.	105.5	Jan.	102.1
Mar.	104.4	July	94.0	Dec.	97.0	Feb.	*105.9*
April	102.7	Aug.	104.7	Year Avg.	101.1		
		Sept.	101.3				

COMPARATIVE YEARLY SUMMARIES

	1940	1941	1942	1943	1944	1945	1946	1947
Year to Date	86.2	88.4	103.8	88.4	88.6	87.9	97.5	104.8
Year Average	85.6	97.4	90.4	87.8	88.1	89.7	101.1	

PAPERBOARD OPERATING RATIOS†

Current Weeks—1947		Corresponding Weeks—1946	
February 8	104	February 9	97
February 15	102	February 16	94
February 22	103	February 23	97
March 1	102	March 2	98
March 8	102	March 9	99
March 15	*104*	March 16	100

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1946	90	97	100	99	94	97	89	99	96	100	99	92	96
1947	99	*103*											

*Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

†Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

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EDITORIAL

Pulp Bottleneck

Linked as it was with the prospect of development in southern Alaska of a new source for pulp and paper, a talk before the tissue industry meeting late in February by Dr. Charles W. Boyce carried conviction for its analysis of the probable future of the industry's pulp supply. In fact, Dr. Boyce who is a consultant to the Bureau of the Census of the United States Department of Commerce, appeared to favor Alaska as a source of pulp rather than as the site of a paper mill.

Paper production in 1947 the Doctor believes can jump a million or more tons over the 1946 record if demand holds up. Except for uncertainties with respect to the supply of market pulp, there is every likelihood that the high paper production rates of the last quarter of 1946 can be improved steadily during the year. But the mills which depend on market pulp may lag behind, some of them quite a ways. There are uncertainties with respect to supplies from domestic and Canadian sources which did not exist last year. The European situation is even more problematical.

The principal uncertainty in the supply of domestic market pulp lies in what will happen, first, to the supply of pulp from integrated operations which high prices of recent years brought out and, second, to the supply of pulp from wholly independent pulp producers who are receiving attractive offers from non-paper consumers of pulp.

Nearly all sulphate pulp which is made for sale by United States producers is the excess production of self-contained mills. A careful check of the trade journals reveals that practically every company selling sulphate pulp today has announced plans for expansion of paper production, and nowhere in the announcements is there reference to the continuation of pulp sales. Some of these expansion projects will be completed in 1947 and I expect a considerable reduction in sulphate pulp sales. The only addition to supply is in the construction of one new independent sulphate mill.

Between 15 and 20 percent of the sales of sulphite pulp is likewise the excess production of self-contained mills. Much of this pulp is scheduled for diversion to own consumption by the end of 1947.

"In all the two, three or four hundred million dollars which the industry is pouring into new capital improvements in the United States," said Doctor Boyce, "only one independent pulp mill is sure at the moment. On the other hand, nearly every integrated mill which sold pulp during the war years is apparently busy installing facilities to use all of their pulp production.

"The situation in Canada is not yet so gloomy. Three or four new mills have come in. Although much of the new pulp is designated for use by affiliated companies in the United States, some will be added to the market supply. Moreover, there seems to be a possibility that some of the numerous British Columbia projects will eventually jell. On the other hand, the integrated excesses will be drained off for own use—and very quickly too if the tariffs on paper are reduced—and other pulp will go to non-paper users.

"Meanwhile in the United States, the need for market pulp is growing. Capacities in converting mills are growing slowly. Technological changes in paper have already forced many integrated manufacturers to purchase kinds of wood pulp which they cannot make. When prices of pulp settle down, or as prices of pulpwood fail to settle down, some of the more costly pulp mills will be forced to close down. In addition to all of this, the demand for non-paper pulp is bounding upward amazingly.

"When all of these things will take place and the extent to which they will take place is problematical. But the fact remains that so long as pulp is derived from wood and present pulping techniques remain economic, every advance in consumption brings nearer the time when available supplies of market wood pulp will have to be increased.

"I have held for many years that the ultimate solution of the perennial pulp question was not political but economic. I now believe that economies have not only solved the old problems but have gone beyond to create a new one. That problem—adequate supplies of market pulp at fair prices—is in my opinion the major problem before the American paper industry, and is one in which every producer of paper above the low-priced mass production grades has a vital interest."

The Gray Market

A tint that is well known in the color spectrum appears to have developed some new characteristics under the light of present and recent market conditions. Gray, heretofore known as an honorable mixture of black and white, in varying degree according to legitimate needs, now has acquired a new distinction as representing a market that is legal enough to avoid the term black, but so far from ethical that it is a good deal less than white. It also has drawn to itself a new quality, the probability that it will disappear—not fade out or get blacker—but simply drop out of sight. A practitioner along its edges recently offered some paper to a printer at a price that represented a handsome profit. He genially answered the buyer's remonstrance about future dealings with the remark that he expected to be out of the business anyway by the time that competition got back in full swing.

W. L. Cook

EDITOR

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122 E. 42nd ST., NEW YORK 17, N. Y. *Edited By* R. G. MACDONALD, *Secretary*

Biochemical Oxygen Demand
A New Expression for the Papermaker*

By Louise E. McGrath[1]

Abstract

The action of bacteria and protozoa in a stream follows a law in utilizing oxygen in the life processes and can be used to measure the amount of organic matter present either in the natural state or the added pollutional load.

The trend to the use of a chemically fortified dilution water in the biochemical oxygen demand determination and the Azide modification in the dissolved oxygen determination is noticeable both in the literature and in actual practice.

With the best of practices the method is accurate to within 10% but is is an excellent measure of what is to be expected when paper mill wastes are discharged into a natural stream.

When the first paper mill was built one of the prime requisites was a stream of good, clean water. Today, some mills are fortunate in still having the use of a good, clean water but the majority of mills take what the up-stream neighbors send to it. Depending upon the grade of paper made, the raw water is either used as it comes to the mill or treated to obtain the desired degree of purity. A large portion of the same river water after passing through the various papermaking processes is returned to the river.

Economical practices have reduced the volume of water passing through the mill. A small volume taken from the river and used and reused conserves valuable heat units and a small volume returned to the river insures the loss of a smaller quantity of papermaking fibers. However, in the best of paper mill practices a certain volume of water must be returned to the stream.

For several years many agencies, both of public and private nature, have become interested in just what the paper mill has returned to the stream and, as time goes by, steps are being taken to see that the waste water which leaves the mill will not have a deleterious effect on the body of water into which it is discharged.

A natural stream has bacteria and protozoa, fish and plants, all living and using in their life processes the oxygen dissolved in the water as it moves along *(1, 2, 3, 4)*. When these biochemical processes occur in the presence of oxygen dissolved in the water the decomposition is called aerobic but in the absence of oxygen it is anaerobic. Aerobic decomposition is usually rapid and results in the formation of stable inoffensive forms. Anaeorbic decomposition results in some stable forms but also in others, such as methane and hydrogen sulphide, odorous and causing the blackening of the water. *(2, 4)*.

The compounds contained in water after passing through the paper mill processes are mainly organic and capable of oxidation and decomposition. Fiber, starches, resins, dyes, and bacteria are contained in the water discharged from the mill. It may be acid or alkaline and contains mineral matter as well.

The demand for oxygen by the waste matter as it reaches the stream offsets the oxygen balance of the stream and if the demand for oxygen is sufficiently high leads to the destruction of fish and plant life and to the presence of offensive odors as well as unsightly deposits *(2)*.

Biochemical Decomposition

The course of the biochemical oxidation whether of the natural organic matter in the stream or of the pollutional load carried in from the mill proceeds in accordance with a definite law. A definite sugar which has a chemical formula requires a definite amount of oxygen to oxidize and results in the production of a definite amount of oxidized matter. It would be difficult to express as a formula the oxidizable matter in water containing paper mill waste. However, the oxygen which it would require to oxidize the overall contents can be measured and can be used to indicate the amount of oxidizable matter present *(2, 4)*.

In 1932, Adeney states the biochemical law as follows: "The quantities of oxygen consumed and of products formed on the completion of each stage of aerobic fermentation are constant for similar volumes of the same polluted water. . . . provided that the dissolved oxygen be in excess of the fermenting matters." The biochemical oxygen demand is then a means of determining the amount of organic matter present in a sample of water by measuring the amount of dissolved oxygen used during

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[1] Member TAPPI; President, Booth Chemical Co., Elizabeth, N. J.

the oxidation of the organic matter and can be expressed as the milligrams of oxygen per liter of water (p.p.m.) *(2, 4)*.

For a more detailed review of the why of biochemical oxygen demand a study of the book "Stream Sanitation" by Earle B. Phelps, "Public Health Bulletin No. 173" by Emery J. Theriault, and the article "Oxygen Demand Test" by J. K. Hoskins in the November 1933 issue of *Sewage Works Journal* is suggested.

Technique

Biochemical oxygen demand (B.O.D.) can readily be determined by direct estimation of the dissolved oxygen contained in suitably prepared samples before and after incubation for a definite period of time *(2, 3, 5, 6, 7, 8, 9)*. The Ninth Edition of "Standard Methods for the Examination of Water and Sewage" recently published includes very detailed instructions for the determination of B. O. D. However, many questions have arisen when the technical man tries to use a method primarily designated for sewage on the effluent from a paper mill.

Needless to say the time honored precautions of eliminating air bubbles should be used in taking the samples *(3, 5)*. The glassware must be unusually clean. Glassware washed with soap and water and rinsed with alcohol or ether still holds some organic matter in the pores of the glass. Glassware carefully cleaned with chromic acid mixture is therefore essential. Tightly stoppered glass bottles of 250- to 300-ml. capacity are recommended in Standard Methods *(5)*. However, bottles of a different size may be used, but care should be taken to vary the proportion of reagents to the size of the bottle.

A controlled incubator or water bath accurate to within $\pm 1°C$. is necessary. Moisture present in the incubator is not enough *(11)*. Water seals definitely should be used.

According to the authorities on the matter biochemical oxidation, since it follows a law, behaves in an orderly manner during the course of the decomposition *(2, 4)*. The oxidation which occurs during the early period of incubation bears a relationship to the oxidation which occurs over longer periods of time. Despite the fact that cellulose does require a longer period of time to decompose *(2)* and the technical man probably feels that the time of the test should be lengthened the 5-day period of incubation is satisfactory. Reactions occur over the longer period which cannot be controlled and which might confuse the results *(11)*.

Dilution Water

Waste water discharged into streams may have a mild effect or be extremely detrimental. Paper mill waste water is considered to be in the same bracket as strong domestic sewage *(11)*. In determining the biochemical oxygen demand, therefore, provision must be made to present sufficient oxygen to the sample while being incubated to insure the oxidation of the organic material. The sample must be diluted and it is in the selection of the dilution water some of the headaches of B.O.D. have arisen *(5, 6, 7, 8, 9, 10, 12)*.

At first, aerated distilled water was used and then it was found that the copper which is frequently present in distilled water inhibited the growth of bacteria. Stored aerated river water into which the waste discharged was then used. Sodium bicarbonate was added to river water *(8, 9, 12)* or added to distilled water in which the copper content did not exceed 0.01 p.p.m. Further work with dilution waters *(7, 9, 12)* resulted in the development of "Formula C" water and eventually this was modified to include ammonium sulphate.

In the Ninth Edition of Standard Methods *(5)* one dilution water only is given which consists of using small quantities of chemicals dissolved in distilled water containing less than 0.01 p.p.m. of copper and aerated. It is probable that within a short time in view of the new Standard Methods that the various authorities will recommend the Standard Methods dilution water.

Seeding

The question has been raised also as to why additional seeding material is necessary when the biochemical oxygen demand is run on paper mill waste water. The bacterial counts for paper mill waste water will vary not only in number but also in the kind of organisms. The count at one mill may be considerably higher than at another mill. Also by a series of experiments *(1, 2, 7, 9, 13)* it was determined that protozoa were necessary as well as bacteria in the oxidation of organic matter. Another authority *(4)* states that at least a count of 100,000 bacteria per milliliter is necessary. Therefore, it would be far more uniform and it would permit better comparison between mills of the B.O.D. results if the same type or organisms were always used in the determination. Despite the fact that bacteria which act on cellulose are not necessarily found in domestic sewage *(2)* Standard Methods recommends that normal unfiltered domestic sewage be used for seeding and this has been found satisfactory in the experience of Dr. Rudolfs and his associates of Rutgers University.

Bacteriacidal Substances

Paper mill waste water contains fiber, resins, starches, etc., which are readily oxidizable but paper mill waste water may also contain toxic substances such as caustic, alkalinity, acid, or chlorinated substances which will inhibit the growth of bacteria in the B.O.D. determination. It is therefore necessary to remove these *(1, 2, 5, 8)* following the methods as outlined in Standard Methods *(5)*. In the case of a waste water containing a large quantity of suspended matter it has been suggested *(11)* that B.O.D. be run on the sample as taken, as well as on the supernatent liquor of the settled sample. It has also been suggested that the samples be shaken about twice a day during the incubation period rather than rotating them during the entire 5-day period. *(11, 14)*.

Some mills are using pentachlorphenates or mercury compounds as disinfectants. It is readily determined whether the quantity present will have a bacteriacidal effect by the B.O.D. results obtained. If the B.O.D. increases as the dilution increases it would appear that in the more concentrated form there is an inhibiting action on the bacteria. Since there are no methods for removing these substances dilution water should be used in which the toxic effect is as small as possible.

Dissolved Oxygen

The method of determining the dissolved oxygen in the diluted and incubated samples is by the time honored Winkler method with certain modifications. Supplement No. 90 to U. S. Public Health Reports (1931) gives the following short description of the

Winkler process. The Winkler process for the determination of dissolved oxygen depends upon the formation of a precipitate of manganous hydroxide in a filled, glass-stoppered bottle. The oxygen dissolved in the water is absorbed by the manganous hydroxide forming a higher oxide of uncertain composition. This upon acidification in the presence of an iodide releases measured quantities of iodine equivalent to the oxygen content of the sample. The iodine is titrated with standard sodium thiosulphate solution.

However, there are certain substances which also interfere in this determination. The Rideal-Stewart modification *(1, 8, 9, 18, 19)* which offsets the effect of ferrous iron is in use in some paper mills *(10)* at this time but the trend seems to be that the Azide modification *(15, 16, 17)* is more satisfactory unless large quantities of sulphites are present *(9, 16)*. Chlorinated compounds have been previously removed in the procedure for B.O.D.

It seems reasonable to expect that because of the necessity for dilution in the B.O.D. procedure the small quantity of fiber present will not interfere with the dissolved oxygen test. If it is suspected that the fiber does interfere it can be removed by precipitation with alum before the dissolved oxygen test is run *(14)*.

Results

There are many ways of expressing the results obtained in the B.O.D. determination. Parts per million are satisfactory. It can also be reported as population equivalent or pounds of oxygen per ton of product. It must be borne in mind, however, that the determination of the biochemical oxygen demand is not a true chemical reaction following all the laws of molecular weights and volumes, but is a process dependent upon living organisms which do not always behave in the same identical manner. The accuracy of the procedure is within 10% unless one is a skilled research worker and if the results obtained check within 10% this also may be considered satisfactory *(11)*.

Conclusions

The amount of organic matter present which is capable of being oxidized by living organisms is then a measure of how paper mill waste water will behave after it is discharged into a stream. If it contains too much organic matter for the normal oxygen content of the stream it is to be expected that there will be an unfavorable effect on the life of the stream and discoloration and odors may be expected.

Winkler first formulated the dissolved oxygen method in 1888, and as early as 1870, Franklin *(3)* was working along the lines of biochemical oxygen demand. Various methods have been used and discarded. In view of the increased interest in the action of paper mill wastes in streams in any of the perplexing problems which arise in the B.O.D. determination are constantly before the attention of technical men both in the mill and in the research laboratory.

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Lake States TAPPI Discusses Forestry

The Lake Section of the Technical Association of the Pulp and Paper Industry met on Tuesday, March 11, 1947 at 6:30 p.m. at the American Legion Club House, Appleton, Wisconsin. About 90 attended.

M. N. Taylor, executive director of Trees for Tomorrow, Inc., Merrill, Wis., gave a 20-minute talk on "Trees for Tomorrow" and presented a 25-minute colored movie on the subject after his talk. Mr. Taylor stated that the Trees for Tomorrow organization is supported by eight paper mills in the Wisconsin River valley with the final goal of reforesting 10 million acres in Northern Wisconsin. In discussing the history of forestry in Wisconsin, Mr. Taylor stated that in 1870 there were 20 million acres of virgin timber in the state, while in 1944 only 40 thousand acres of that timber remained standing. Through their nursery at Wisconsin Rapids, Wis., Trees for Tomorrow, according to Mr. Taylor, will have between 80 and 100 million trees available per year for planting when their program is fully under way in the next three to four years.

The movie was devoted to the activities of the Conservation Camp at Eagle River, Wisconsin.

Those attending were: A. P. Adrian, J. Atchison, William V. Arnold, Jr., Arnold Beaman, Murray H. Bennett, Paul Boronow, Wm. Broadwell, M. A. Buchanan, Doten Bush, Andreas Christensen, H. A. Chuse, George L. Clark, Arthur A. Coffin, William L. Cogger, Robert J. Courtney, G. K. Dickerman, M. L. Downs, R. F. Dunger, C. R. Faulkender, William A. Fannon, Jim Freiberg, K. W. Fries, George W. Forcey, L. V. Forman, A. T. Gardner, John Graff, J. W. Grimes, H. L. Gruehn, H. F. Hackworthy, Paul B. Hansen, Ralph S. Hayden, John M. Hayes, A. M. Heald, Theo. M. Helf, Raymond W. Henschel, Ray N. Hollands, T. A. Howells, Eugene G. Ingalls, I. H. Isenberg, William S. Kennedy, A. R. Kjellgren, Joseph Kryszak, C. W. Larsen, Harold Lausman, N. L. Malcove, G. M. Markle, W. M. McGraw, Miles R. Meidam, Peter J. Metz, Jr., W. A. Mitchell, L. A. Moss, T. A. Pascoe, E. R. Passow, Leroy E. Patterson, A. Phillips, Kenneth E. Pinkerton, Wm. J. Plank, S. W. Pollock, John H. Rhode, Herbert W. Rowe, Fred W. Sanders, Milton A. Schreiner, W. L. Shaw, W. C. Shaw, Howard K. Sheldon, Clyde W. Steele, Fred O. Sullivan, Frank Swedish, M. J. Taylor, M. N. Taylor, S. A. Trivedi, Vernon H. Truesdale, S. R. Turner, Walter C. Utschig, Harold Vanderhie, J. D. Wells, S. D. Wells, C. J. West, Jr., Warren Whitlinger, J. C. Wollwage, C. Youngchild.

Kalamazoo Valley TAPPI Discusses Deinking

On last Thursday evening we had a very successful Kalamazoo Valley Section of Technical Association of the Pulp and Paper Industry meeting at the Columbia Hotel, Kalamazoo, Mich., at which time was discussed the subject of deinking. The process was explained at a meeting attended by 88 mill men. To quote the Kalamazoo Gazette, "Keen interest in the deinking discussion among paper mill men of the valley kept a group at the Columbia Hotel far beyond the usual hour Thursday evening. More than four hours were given by members of the Kalamazoo Valley Section of the Technical Association of the Pulp and Paper Industry to the subject."

Lee Mimms, Vice Chairman and Program Chairman, acted as Toastmaster. Harris Ware of Hercules Powder Company acted as Moderator. Robert Erikson of the Graphic Arts Laboratory outlined and defined the problem of deinking. He covered the laboratory phase of the problem and called to the attention of the group the variance of physical and chemical conditions and their effect upon the problem of deinking; the types in inks; the types of fibers which might be involved and mentioned specifically the importance of de-fibring, the extreme agitation and treatment by special chemical means which are necessary to successfully carry out laboratory deinking. He mentioned that a pilot plant in his organization had been used to confirm most of the results obtained in his laboratory.

William Kirkpatrick, technical director of Allied Paper Mills, gave a complete description of the Allied Paper Mills process along with flow diagrams, brightness figures and details of bleaching.

Louis Scheid, Superintendent of the Watervliet Paper Company, gave a complete description of the Watervliet Paper Company process and Mr. James Wise, vice presidenit of Kalamazoo Paper Company, gave to the group a complete description of the Kalamazoo Paper Company process. Kirkpatrick and Scheid told of the comparative effectiveness of the hydrapulpers used in their mills in the deinking problem and along with Wise and Erikson, displayed samples of paper made from deinked stock as practiced by their methods.

During the talks by the panel of experts, those attending the meeting jotted down questions which they wished to present to the panel. These were passed out to the four members of the panel after the conclusion of the formal talk. For more than an hour and one-half the panel answered some 30 to 35 questions as rapidly as they could and as thoroughly as they could.

Typical of these questions were such ones as, What is the average shrinkage experienced in each mill represented by the panel? What are the relative values of soda ash and caustic soda in deinking. How is blueprint paper defibred and handled in deinking operation? What is the prime function of caustic soda in deinking? What is the value of soft water deinking and washing? What are the effects of various wetting and scouring agents which are being proposed for use in deinking? And—what is the economic structure of coating versus deinking, that is, when it is more economical to coat and when it is more economical to deink.

Those present included: Paul Applegate, Albert C. Aiken, Paul R. Anderson, Ralph Atkins, P. W. Bartholomew, Harry C. Bradford, C. D. Beebe, D. S. Bachelder, Art Coffin, Wayne E. Crotty, W. F. Costello, A. M. Cole, O. W. Callighan, J. D. Chadderton, Fred L. Chappell, Jr., C. T. Colgren, J. A. Dean, Jack Dickson, J. R. Dan, Frank B. Eilers, D. R. Erickson, H. S. Faram, Claude Fletcher, A. F. Fischer, Mayron F. Flotow, M. S. Fogerty, F. Fisher, R. C. Germanson, M. Galbraith, C. E. Gardner, Eldred Hall, Jos. Horacer, Jr., Roy W. Holden, W. F. Hathaway, K. Helge Holm, F. R. Hamilton, H. D. Hamilton, P. S. Hewett, W. J. Higbie, Carl Hoelderle. J. A. Heena, H. Kindig, Morris W. Kane, Melvin J. Killian, W. A. Kirkpatrick, Ken Latimer, A. T. Luey, C. W. Lillie, Leo. O. Lake, Frank Libby, L. H. LaLiberty, Robert Ludwig, P. F. Morgan, S. W. Murphy, Y. O. Manor, Lee H. Mimms, D. W. McArthur, D. Militzer, Myron Oliver, H. Page, Howard Parker, Al Perlick, R. H. Pete, Henry Reeves, Jr., J. S. Reicert H. C. Richardson, E. P. Spreen, F. Sission, A. L. Sherwood, Dwight Stocker, F. J. Snider, Hugh Smith, J. E. Shade, L. J. Smith, V. Stoeffler, R. C. Schuler, L. J. Scheid, R. D. Trelfa, W. R. Tobin, E. B. Taylor, C. E. Van Buren, Harris S. Ware, James A. Wise, M. P. Wingate.

TAPPI Notes

S. G. Norton is now assistant to the plant superintendent, Hercules Powder Company, Brunswick, Ga.

Will J. Lessard, formerly of Chas. T. Main, Inc., is now chief engineer of B-F-D Company, Plattsburg, N. Y.

Leo J. Rampel, formerly of the Rampel Chemical Company, is now president of the Perm-Aseptic Corporation, Mamaroneck, N. Y.

Richard Nugent is now superintendent of the Nekoosa Mill, Nekoosa Edwards Paper Company, Nekoosa, Wis.

Neil H. Christian is now superintendent of the Port Edwards Mill of the Nekoosa Edwards Paper Company, Port Edwards, Wis.

Matthew J. Healy, Jr., formerly of the Rising Paper Company, is now partner in the firm of Healy, Foley & Olsen, Inc., 61 East 9th St., New York. N.Y.

Vernon Peakes, formerly of the Alpha Cellulose Corporation, is now chief chemist of the Reynolds Research Corporation, Glen Cove, L. I., N. Y.

Olof Olsson and E. Diedrichs of the Mo and Domsjo A/B., Husum, Sweden, are visiting mills in the United States and Canada.

More than 550 individuals are enrolled in the course in pulp and paper given by New York University at the Barbizon Plaza, in New York City. About 100 more applicants could not be accommodated because of inadequate seating accommodation. This course of fifteen weekly lectures is being given largely by members of the Technical Association of the Pulp and Paper Industry. Arrangements for the course were made by Harold M. Annis of the Oxford Paper Company and R. G. Macdonald, Secretary of TAPPI. Mr. Annis presides as moderator of the lecture sessions. Last week C. G. Landes of the American Cyanamid Company lectured on paper sizing. This week Rex Vincent of the Bulkley Dunton Pulp Company lectured on stock preparation and next meeting Phil Goldsmith of the Pusey & Jones Company will discuss papermaking machinery.

A similar course for graduate engineers is being given at the Polytechnic Institute of Brooklyn. Last week Frederic C. Clark, consulting engineer, New York City, lectured on the paper machine design.

Agricultural Residue Pulps–Comparison With Typical Wood Pulps*

By S. I. Aronovsky[1], Alan Rhodes[2], and E. C. Lathrop[3]

Abstract

The beating and strength characteristics of five agricultural residue soda pulps and some typical wood pulps were compared, using the same methods and equipment for both types of pulps. Standard laboratory beaters with sharp and dulled tackle, a Morden laboratory beater, and a fiber fractionator were among the equipment used. The handsheets and tests were made in accordance with the TAPPI Standards.

The results showed that the agricultural residue pulps compared favorably with wood pulps in all of the strength characteristics except tear resistance. Except for the latter value, wheat straw soda pulp had better strength properties and required much less beating than softwood sulphite pulps. The standard pulp testing equipment and methods are suitable, in the main, for agricultural residue pulps.

The importance of the utilization of agricultural residues in the economy of the country is receiving constantly increasing recognition by agriculture and industry. Agricultural residues, including straws, stalks, stems of various types, cobs, hulls, and similar materials constitute approximately two-thirds of the total farm crops, and amount to about 200 million tons (dry basis) annually (*1*). Of the approximately 100 million tons of these residues which might be made available for industrial use, less than 2 million tons, or 2%, is so utilized. This is in sharp contrast with the accomplishment by industry of relatively complete utilization of industrial by-products.

Since the largest proportion of all of the available agricultural residues is lignocellulosic in character and fibrous in structure, the production of pulps and papers appears to offer an outlet for a considerable tonnage of these residues. The Pulp and Paper Section was therefore formed in the Agricultural Residues Division of the Northern Regional Research Laboratory to study and attack this problem (*2*). A survey of the rather voluminous literature on the production of pulp and paper from various agricultural residues and experience in pulp and paper technology and manufacture led to the conclusion that the previous approach to the problem, namely, the production of cheap substitutes from farm residues, was unsound technologically and economically. Some of the more important reasons for the failure of farm residues to make much headway in pulp and paper production in this country may be: (a) the false assumption that these residues cost practically nothing; (b) infrequent and scattered attacks on the problem, mainly in periods of shortage of other papermaking materials; (c) failure to consider the fundamental physical and chemical properties of the residue materials; and (d) the attempt to use existing wood pulping processes and equipment without suitable modification. It appeared, therefore, that a new method of attack would be necessary for a successful solution of this problem.

After considerable thought it was decided that the best and soundest approach was to determine the properties and characteristics of the various agricultural residues and the fundamental differences among themselves and between them and other papermaking materials. Then, by capitalizing on the particular properties of these residues it might be possible to establish their rightful place in industry on a utilitarian and economic basis. Several examples of commercial enterprises in the pulp and paper field may be cited wherein success resulted from recognition and utilization of the specific properties of the agricultural residue materials involved. The excellent formation, strength, opacity, and printability of light-weight esparto book and bible paper is largely due to the very narrow diameter and ease of hydration without fibrillation of the esparto fiber. The high pentosan content and the consequently relative ease of hydration of wheat straw pulp makes it an outstanding material for the production of stiff corrugating paper. The rigid specifications of cigarette paper are best met by the strong bast fiber of flax straw. The long, rough springy fiber bundles of bagasse produce a superior insulating board of low density and high strength and ruggedness. These examples indicate the soundness of the stated plan of attack. This approach to the problem obtained the complete approval of a large number of mill operators and technical men with whom these ideas were discussed.

In order to determine the value of an improved or new pulp or paper product it must be compared with similar products currently in use. Calibration of the approved modern pulp evaluation equipment assembled at this Laboratory in terms of several "standard" types of widely-used commercial wood pulps (standard in the sense that they meet certain minimum specifications) was therefore undertaken as one of the first steps in this plan of attack on the agricultural residue pulp problem. The present paper deals with this first step of the program. Several hundred pounds each of various types of these wood pulps were obtained and tested by the standard methods (*3*) in use in the pulp and paper industry. A number of agricultural residue pulps was then prepared and tested with the same equipment and methods.

Experimental

The commercial wood pulps included bleached and unbleached softwood sulphite, bleached hardwood sulphite, bleached softwood neutral sulphite, bleached hardwood soda, and unbleached softwood kraft. These pulps came from all parts of this country except the deep South. Since it is impracticable to record the

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[2] Formerly chemical engineer, Pulp and Paper Section, Agricultural Residues Division, Northern Regional Research Laboratory,[4] Peoria, Ill.
[3] Member TAPPI. Head, Agricultural Residues Division, Northern Regional Research Laboratory,[4] Peoria, Ill.
[4] One of the laboratories of the Bureau of Agricultural and Industrial Chemistry, Agricultural Research Administration, U. S. Department of Agriculture.

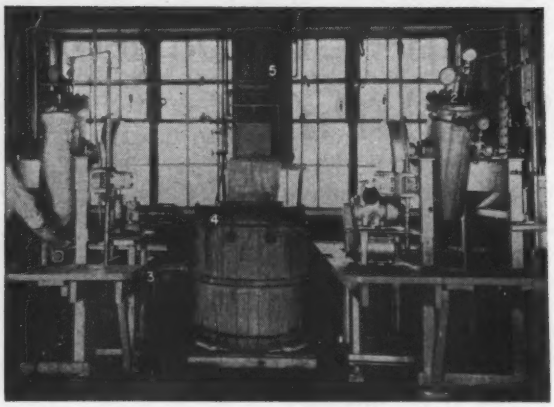

FIG. 1

Pulp digestion equipment in the Northern Regional Research Laboratory: (1) and (2) stainless steel, 12-gallon capacity autoclaves; (3) blow line; (4) blow pit with perforated stainless steel false bottom; (5) spray tower for removal of noxious fumes and gases.

results on all of these wood pulps here, only those on bleached and unbleached western softwood sulphite, bleached midwestern hardwood soda, and unbleached eastern softwood kraft are reported in this paper. All of these pulps were received in the form of air-dry sheets and were stored in a room kept at 73° F. and 50% relative humidity.

The agricultural residue pulps were prepared from wheat and rice straws, sugarcane bagasse, flax shives, and hemp hurds. The raw materials were cooked with sodium hydroxide (NaOH) at 170° C. (100 p.s.i.). The total liquid-to-solid ratio in the digestion was 8:1. The cooked material was washed with water and screened through a 4-cut (0.004 inch width slots) laboratory flat screen. The thin fiber suspension discharged from the flat screen was flowed onto a 100-mesh wire cloth, inclined about 30° from the horizontal, which acted as a thickener and at the same time removed pulp fines and particles smaller than 100 mesh. The screened, thickened pulp was pressed to a moisture content of 75 to 80% prior to sampling for yield data. The cooking conditions and yields of the agricultural residue pulps are given in Table I. The screened pulps were evaluated by the standard TAPPI methods.

The pulp and paper apparatus used in this work included: (a) two standard 1.5-pound, Niagara-type beaters, one with the sharp tackle and the other with the roll bars dulled; (b) a vertical beater (Morden); (c) a pulp fractionator (Bauer-McNett); (d) Mullen bursting testers; (e) an Elmendorf tear tester; (f) Schopper folding testers; and (g) Schopper tensile and stretch testers. Some of this equipment is illustrated in Figs. 1 and 2.

Results and Discussion

STANDARD BEATER—SHARP TACKLE

The beating and strength data for four typical wood pulps and the five agricultural residue pulps are shown in Fig. 3. The beater used in obtaining these data was "ground in" in accordance with the recommended TAPPI procedure T-200 m-43. Some of the differences in the beating and strength characteristics between the wood pulps and the agriculutral residue pulps are clearly indicated in these curves. The bursting and tensile strengths of agricultural residue pulps used in these studies were as high as, and with wheat straw and

TABLE I.—COOKING CONDITIONS AND YIELDS OF AGRICULTURAL RESIDUE PULPS

		Cooking Conditions [a]			Yields [b]			
Agricultural Residue	Cook No.	NaOH,[b] %	Temp., °C.	Time at Temp., hr.	Crude Pulp, %	Screened Pulp, %	Screenings, %	Fines,[c] %
Sugarcane bagasse	202-204	15	170	2	57.6	49.2	0.4	8.0
Flax shives	206, 207 209, 210	30	170	2	40.1	32.3	0.8	7.0
Hemp hurds	212-214	30	170	2	44.1	38.4	0.4	5.3
Rice straw	199-201	15	170	2	51.6	34.2	0.5	16.9
Wheat straw	184-187	15	170	2	48.9	37.4	1.6	9.9

[a] Ratio of total liquid to solid, 8:1.
[b] Basis moisture-free raw material.
[c] By difference.

hemp hurd pulps higher than, those of sulphite wood pulp. The values for the wheat straw and hemp hurd soda pulps approached the bursting and tensile strengths of the northern kraft wood pulp. As indicated by the curves, all the residue pulps were deficient in tear resistance in comparison with the softwood pulps, but they had slightly higher tear resistance than the hardwood soda pulp. The sharp rise in the tear resistance curves of the softwood pulps, and the more gradual rise of the hardwood pulp curve, followed by a less sharp fall and then a gradual decrease with increased time of beating, was not evidenced by the residue pulps. This may be a characteristic of the agricultural residue pulps, but it seems more likely that these residue pulps were partly hydrated during cooking, and thus did not require a short beating period to produce maximum tear resistance. The relatively high bursting and tensile strengths of all of the unbeaten agricultural residue pulps tend to corroborate this hypothesis.

The fold values for the softwood pulps were higher than those for all of the agricultural pulps with the exception of wheat straw pulp. The latter had slightly greater folding strength than the sulphite pulps, but less than the kraft wood pulps. All of the pulps with the exception of those from hemp hurds and flax shives showed the typical reverse-S freeness curves. There was considerable difference, however, in the rate of freeness reduction of the various pulps.

The outstanding difference between wood and agricultural residue pulps is best illustrated in Fig. 3,

FIG. 2

Pulp evaluation room in the Northern Regional Research Laboratory: (1) Dulled standard beater; (2) sharp standard beater; (3) fiber fractionator; (4) modern beater; (5) flat screen; (6) inclined saveall and thickener screen; (7) square sheet mould; (8) standard (British) sheet mould.

by the curves for sugarcane bagasse and wheat straw soda pulps. This is the difference in rate of hydration, or beating, to attain the maximum strength characteristics. While it required 40 to 60 minutes, using the same beating conditions, to obtain the optimum strength values with the wood pulps, only 20 to 30 minutes were required for the corresponding values with bagasse and wheat straw pulps. This is probably because of the high pentosan or hemicellulose contents of these two pulps as compared with the wood pulps (Table II). It is well known that pulps of higher hemicellulose content hydrate more easily, with a consequent saving in power, than do pulps with lower hemicellulose content. The hemp hurd, flax shive, and rice straw pulps, containing less pentosan (Table II) than the bagasse and wheat straw pulps, thus required longer beating periods to attain their optimum strength values.

The bursting and tensile strengths of the hemp hurd pulp were considerably greater than expected, considering the relative shortness of the average fiber length (Table III). No clear explanation for this anomaly can be given at this time.

Standard Beater—Dulled Tackle

Because wheat straw is one of the predominant agricultural residues available in this country for industrial utilization, and is already being used for the manufacture of strawboard pulp, it was selected as the starting raw material for process development work in this Laboratory. The relatively short beating period required for the wheat straw pulp (Fig. 3) with the standard beater was considered inadequate for a detailed study of the strength development of this type of pulp. It was also thought that it might be desirable to do more hydrating and less cutting of the relatively short agricultural residue fibers. Therefore, the bar edges of the roll of the second beater were rounded slightly, but fairly evenly, with a file. After several runs in this dulled beater with the same pulp, consistent check results were obtained with 3,500 grams on the beater arm and a consistency of 1.75%. These conditions decreased the rate of beating and strength development of the pulps, but they gave somewhat higher optimum values than were obtained with the standard conditions of 5,500 grams on the beater arm and 1.57% consistency. These milder conditions were also found desirable to eliminate "chattering" or grinding of the beater tackle in the relatively thin stock suspension of short-fibered pulp at the standard consistency. This dulled beater was then used for evaluating the wood sulphite and the agricultural residue pulps and the data are shown in Fig. 4.

A significant, but expected, result of dulling the beater roll bars was the general increase in the optimum strength characteristics of the pulps. This was particularly true of the tensile strength and of the bursting strength, which showed an increase of from 1 to 7 points over the corresponding values obtained

TABLE II.—PENTOSANS, LIGNIN, AND ASH IN WOOD AND IN AGRICULTURAL RESIDUE PULPS

Pulp	Cook No.	In Pulp [a] Pentosans, %	Lignin, %	Ash, %
Unbleached wood sulphite	Commercial	4.0	2.2	0.4
Bleached wood sulphite	Commercial	3.9	..	0.3
Bleached hardwood soda	Commercial	17.6	..	1.0
Unbleached wood kraft	Commercial	10.0	3.4	0.8
Bagasse soda	202-204	24.8	2.8	0.9
Flax shive soda	206, 207, 209, 210	14.2	6.0	3.2
Hemp hurd soda	212-214	14.1	1.6	2.8
Rice straw soda	199-201	21.2	3.0	14.0
Wheat straw soda	184-187	26.5	4.5	2.8

[a] Basis moisture-free pulp.

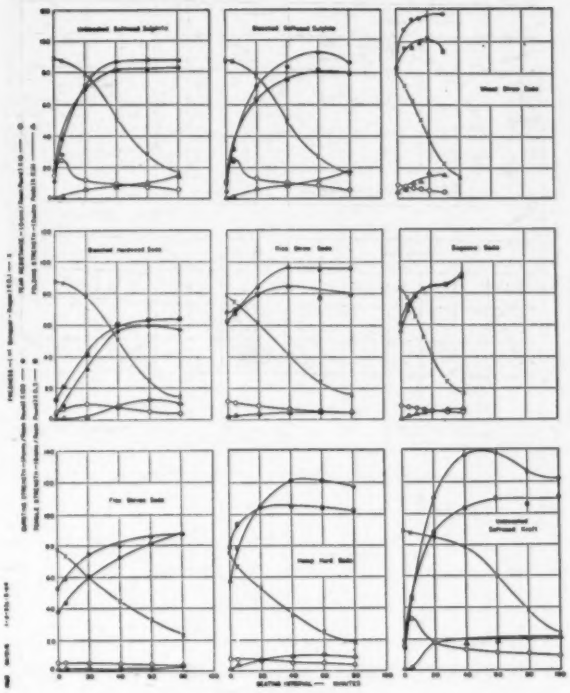

Fig. 3
Beating and strength characteristics of wood and agricultural residue pulps. Standard sharp beater.

with the sharp-bar beater. Relatively higher tear-resistance values were obtained for the unbleached sulphite pulp with the dulled beater, due no doubt to the lesser degree of cutting obtained with this beater. The increase in tear values of the agricultural residue pulps was very slight, however, since these pulps had relatively low original tear resistance. This is illustrated particularly well by the curves for flax shive and hemp hurd pulps.

As in the case of the sharp-bar beater, the fold value for the wheat straw pulp was higher than that for the wood sulphite, but all of the other residue pulps had lower values.

The wood sulphite, bagasse, and wheat straw pulps had the typical reverse-S freeness curves, but approximately straight lines were obtained for the other agricultural residue pulps. Since the wood sulphite, bagasse, and wheat straw pulp fibers are longer than those from the flax shive and hemp hurd pulps (Table III), it is quite likely that the freeness curves for the latter pulps are mainly the result of hydration, with little or no cutting. Although rice straw fiber has nearly the same average length as wheat straw fiber, it apparently presents a special case. This may be because of its high ash and silica content. Previous work on bleaching rice straw pulp had already shown that its chemical behavior was different from that of the other agricultural residue soda pulps *(7)*.

The strength and beating curves obtained with the dulled beater appeared to be in about the same order as in the tests with the sharp beater. It is evident that, with the exception of tear resistance, the strength characteristics of the agricultural residue pulps were as good as those of the sulphite wood pulp and that wheat straw soda pulp had even better strength properties. The results on hemp hurds were similar to those obtained with the sharp beater. Dulling the beater roll bars therefore had the desired effect of de-

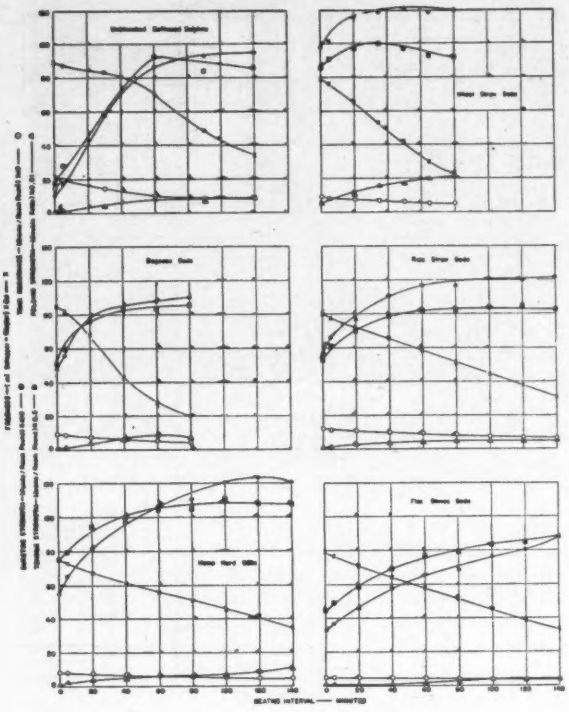

FIG. 4

Beating and strength characteristics of wood and agricultural residue pulps. Dulled standard beater, 1.75 per cent stock consistency, 3500 grams on the beater arm.

creasing the rate of beating and strength development without affecting the pulp properties adversely.

MORDEN BEATER

In 1935, Morden and McGregor *(8)* described a new laboratory beater, which gave a complete beating curve in about 5 minutes. The optimum strength values of the beaten pulps were intermediate between the high results obtained with the standard TAPPI beater and those produced on commercial paper machines *(9, 10)*. The Morden laboratory beater is essentially a vertical jordan-type machine with bars on the conical bronze plug and inside the conical bronze shell. The stock is driven to the top of the plug by centrifugal force, and impeller blades at the top of the plug throw the pulp to the outer region of the vessel or reservoir surrounding the shell. The stock falls by gravity to the bottom of the reservoir where it is again taken up by the pump-like action of the tapered plug. The bottom of the plug rests on a *lignum vitae* bearing which can be lowered to obtain contact between the bars of the plug and shell. The plug is centered on a direct motor-driven shaft fitted with two weights near the top and with a dial micrometer on top. The weight of the shaft is 20.2 pounds, and the removal weights total 9.0 pounds.

The stock, 100 grams (moisture-free basis) of pulp at 2% consistency, is placed in the beater, the motor is started, and the *lignum vitae* bearing is then lowered. The dial micrometer, which had been previously adjusted to zero with only water in the machine, now registers the thickness of the pulp layer (dial reading/5 = clearance in 0.001 inch) between the plug and shell. As the fiber is shortened and flattened through beating) the clearance between the plug and shell is gradually reduced. Sampling is accomplished by a special hand-operated plunger which extracts a 425-gram sample of the stock mixture from the reservoir. After removing six such samples, so little stock remains in the machine that it is difficult to remove another complete sample. Some of the runs therefore were made by using a full 100-gram charge for each beating interval. These runs are designated as "multi-batch" and the others in which one charge of stock was used for the full run are labelled "single-batch." Some of the agricultural residue pulps showed relatively little clearance between the plug and shell. The two weights attached to the shaft near the top were removed before beating a number of these pulps. This decreased the rate of beating but resulted in somewhat increased strength development of the pulps.

The data on beating and strength development with this Morden beater are given in Table IV and shown in Figs. 5 and 6. The curves in Fig. 5 were obtained on beating kraft, soda, and sulphite wood pulps and wheat straw, with and without the shaft weights on the beater plug. A single batch was used for the entire run for each pulp. The strength properties of the pulps developed with the vertical beater were of the same order as, but of lower value than, those obtained with the TAPPI standard beater. It may also be noted that removing the shaft weights resulted in higher strength values for both the wood sulphite and the wheat straw pulps. The strength characteristics of the wheat straw pulp were better, except for tear resistance, than those of the sulphite wood pulp. Compared with the kraft wood pulp, only the bursting strength and tear resistance values of the wheat straw pulp were inferior. The wheat straw pulp was superior to the wood soda pulp in all of the strength properties measured. Here again the greater ease of hydration of the wheat straw pulp was evident.

TABLE III.—AVERAGE FIBER LENGTHS OF WOOD AND OF AGRICULTURAL RESIDUE PULPS

Pulp	Average Fiber Length, mm.	Reference [a]
Unbleached wood sulphite	1.7	(4)
Bleached wood sulphite	2.0	(4)
Bleached hardwood soda	0.7	(4)
Unbleached wood kraft	2.2	(4)
Bagasse	1.7	(5)
Rice straw	1.4	(5)
Wheat straw	1.5	(5)
Hemp hurds	0.6	(6)

[a] Numbers in parentheses refer to literature cited.

TABLE IV.—CLEARANCE BETWEEN PLUG AND SHELL OF MORDEN BEATER IN 0.001 INCH

Pulp	Morden Run No.	Batch	Weight [a]	Figure Reference	Time of Beating, minutes 0	0.25	1	2	3	4	5	6	7
Unbleached wood sulphite	4, 5, 12	Single	+	3	7.0	5.2	3.0	...	2.3	...	1.3	...	0.9
	56, 57	Single	—	3	...	8.3	5.7	...	4.0	...	1.6	...	0.8
Unbleached wood kraft	32, 33	Single	+	3	...	7.3	5.6	4.6	3.2	2.2	1.3	...	...
Bleached hardwood soda	46, 47	Single	+	3	...	0.45	0.15	...	0.1	...	0.04	...	0.02
Wheat straw soda	66, 67	Single	+	3	...	0.3	0.25	0.2	0.12	0.1	...	...	...
	60, 61	Single	—	3	...	0.45	0.35	0.28	0.26	0.24	...	...	...
	62, 63	Multi-	—	4	..	0.35	0.3	0.3	0.3	0.3	0.3	...	...
Bagasse soda	70, 71	Multi-	—	4	...	0.53	0.48	...	0.44	...	0.41	...	0.39
Flax shive soda	72, 73	Multi-	—	4	...	0.06	0.04	...	0.04	...	0.04	...	0.04
Hemp hurd soda	74, 75	Multi-	—	4	...	0.13	0.1	...	0.1	...	0.1	...	0.1
Rice straw soda	68	Multi-	—	4	...	0.16	0.1	0.08	0.08	0.04	...	...	...

[a] (+) = Weights on shaft; (—) = Weights removed.

TABLE V—CLASSIFICATION OF WOOD AND AGRICULTURAL RESIDUE PULP FIBERS DURING BEATING

Pulp	Beater	Freeness	Cumulative Percentage Retained On Mesh			
			14	28	65	100
Unbleached wood sulphite	Regular dulled	*880	58.8	79.7	90.0	92.5
		800	32.5	57.3	78.5	83.0
		500	28.0	46.3	67.7	75.0
		300	27.2	41.0	61.3	70.5
			20	35	65	150
	Regular sharp	*880	68.7	79.6	87.5	91.7
		800	42.0	58.0	70.5	85.5
		500	38.0	48.0	61.0	76.0
		300	29.0	40.5	54.0	71.5
			14	28	65	100
	Morden plus weights	*880	58.8	79.7	90.0	92.5
		800	26.0	51.0	74.0	81.0
		500	23.0	44.0	67.3	76.2
		300	15.5	36.5	58.0	69.0
			20	35	65	150
	Morden plus weights	*880	68.7	79.6	87.5	91.7
		800	40.4	60.5	78.0	87.2
		500	33.6	45.9	65.0	79.9
			20	35	65	150
Unbleached wood kraft	Regular sharp	*870	68.2	83.7	92.7	95.6
		800	58.0	74.5	87.8	92.3
		500	42.8	61.2	77.8	85.0
		300	38.0	57.5	75.4	83.6
			20	35	65	150
	Morden plus weights	*870	68.2	83.7	92.7	95.6
		800	51.0	69.1	85.0	90.2
		500	37.0	56.5	75.1	82.7
			20	35	65	150
Bleached wood sulphite	Regular sharp	*885	65.3	79.1	87.5	92.4
		800	42.1	56.0	73.5	84.2
		500	37.6	47.0	62.3	78.6
		300	25.5	37.7	51.8	69.1
			20	35	65	150
	Morden plus weights	*885	65.3	79.1	87.5	92.4
		800	38.3	56.0	74.2	84.3
		500	33.7	43.3	61.7	78.2
			14	28	65	100
Bleached hardwood soda	Regular dulled	*865	0.2	31.5	77.7	84.3
		800	0.3	15.6	64.1	72.8
		500	0	5.0	44.2	57.5
			20	35	65	150
	Regular sharp	*865	5.7	40.0	77.2	85.5
		800	2.3	28.6	71.2	82.7
		500	0.9	13.5	48.8	67.7
		300	0	4.4	34.3	58.6
			14	28	65	100
	Morden minus weights	*865	0.2	31.5	77.7	84.3
		800	0.3	21.3	67.2	74.3
		500	0	9.6	52.7	62.1
			20	35	65	150
		*865	5.7	40.0	77.2	85.5
		800	2.0	24.0	65.1	78.2
		500	0	14.0	53.2	69.7
			20	35	65	150
Unbleached bagasse soda	Regular sharp	*865	8.6	30.5	70.7	91.5
		800	8.0	28.5	68.5	89.1
		700	7.0	25.8	65.3	87.2
		500	5.4	21.0	60.5	85.0
		300	3.5	15.5	52.0	80.0
			20	35	65	150
	Morden minus	*865	8.6	30.5	70.7	91.5
		800	7.0	28.5	70.5	90.3
	weights	700	6.3	26.8	68.7	88.7
		500	5.3	24.6	64.4	85.7
		300	2.8	17.0	53.5	78.7
			20	35	65	150
Unbleached flax shive soda	Regular sharp	*805	1.3	7.3	53.4	83.1
		700	0.7	4.0	40.4	80.6
		500	0.1	1.4	34.5	72.7
		300	0.1	0.4	23.8	62.7
			20	35	65	150
	Morden plus weights	*805	1.3	7.3	53.4	83.1
		700	0.5	3.0	42.2	76.3
		500	0.1	0.5	29.0	67.2
			20	35	65	150
	Morden minus weights	*805	1.3	7.3	43.4	83.1
		700	0.7	4.2	49.5	80.5
		500	0.2	1.0	36.0	69.8
		300	0.2	0.4	20.6	57.6
			20	35	65	150
Unbleached hemp hurd soda	Regular sharp	*775	0.7	2.9	69.7	90.8
		700	0.5	2.0	63.3	87.4
		500	0.2	0.5	48.3	79.9
		300	0.2	0.7	36.6	72.6
			20	35	65	150
	Morden plus weights	*775	0.7	2.9	69.7	90.8
		700	0.5	2.4	59.0	86.0
		500	0.1	0.5	43.2	75.9
			20	35	65	150
	Morden minus weights	*775	0.7	2.9	69.7	90.8
		700	0.5	2.7	68.0	89.0
		500	0.1	0.4	54.7	79.8
		300	0	0.2	36.7	68.6
			20	35	65	150
Unbleached rice straw soda	Morden plus weights	*820	2.2	21.6	62.9	75.6
		700	0.9	13.7	54.5	69.9
		500	0.4	6.1	39.0	53.3
			20	35	65	150
	Morden minus weights	*820	2.2	21.6	62.9	75.6
		700	0.9	14.3	56.2	69.9
		500	0.4	9.3	47.3	59.8
		300	0.3	6.2	37.8	52.8
			14	28	65	100
Unbleached wheat straw soda	Regular dulled	*805	0.8	20.9	64.4	73.8
		700	0.6	21.2	63.8	72.7
		500	0.8	19.2	59.7	68.0
		300	1.0	14.2	52.1	62.5
			20	35	65	150
	Regular sharp	*805	1.8	28.3	62.4	83.7
		700	1.5	21.0	56.0	78.3
		500	1.5	17.5	50.5	73.2
		300	1.7	13.0	43.7	69.2
			14	28	65	100
	Morden minus weights	*805	0.8	20.9	64.4	73.8
		700	0.5	19.8	63.0	72.0
		500	0.3	15.4	56.8	66.5
		300	0.3	10.0	51.0	61.2
			20	35	65	150
		*805	1.8	28.3	62.4	83.7
		700	1.6	26.5	60.8	81.5
		500	1.2	21.9	55.7	77.7
		300	1.5	13.0	43.6	70.0

* Unbeaten pulp.

The data in Table IV show quite large differences in the clearance between the plug and shell of the Morden beater for the wood pulps and for the agricultural residue pulps. It may be seen that the clearance for the long-fibered wood is reduced rapidly, presumably due to cutting of the fibers. The short-fibered wood and agricultural residue pulps, on the other hand, showed only a relatively small reduction in plug-shell clearance during the beating runs. Removal of the shaft weights resulted in a slightly larger clearance throughout the beating cycles.

Figure 6 illustrates the beating and strength characteristics of the five agricultural residue pulps obtained with the Morden beater with the shaft weights removed, and with a full charge of stock for each beating interval. One curve for wheat straw pulp, using a single batch for the entire beater run, is included for comparison. While the bursting and tensile strengths were a little higher and the fold and tear resistance and rate of beating were slighly lower for the multi-batch than for the single-batch runs, the differences are too small to be of practical significance.

The multi-batch beating and strength curves for the bagasse, flax shive, hemp hurd, and rice straw soda pulps show that this type of beating gave results comparable to those obtained with the dulled standard beater. The beating and strength characteristics of all of these residue pulps, with the exception of hemp hurd pulp, were distinctly inferior to those of wheat straw pulp. The hemp hurd product excelled the wheat straw pulp only in tensile strength under these beating conditions. The small plug-shell clearances given in Table IV for the flax shive, hemp hurd, and rice straw pulps are a fair indication of the relatively short lengths and small diameters of those fibers as compared with wood pulps and with some of the other agricultural residue pulps. This may also account, in part, for the slower rate of beating of these short-fibered pulps as compared with that for the wheat straw and bagasse pulps.

It must be emphasized here, in comparing the agricultural residue pulps amongst themselves and with wood pulps, that these residue pulps were all processed under one set of cooking conditions, except for the amount of chemical used. It is quite probable that the relatively poorer pulps would show improved properties if the optimum pulping conditions for each agricultural residue were developed.

Fiber Fractionation

The wood and agricultural residue pulps were fractionated, at several stages during the beating, in the four-compartment Bauer-McNett classifier, using screen mesh combinations of 14-28-65-100, 20-35-65-150, and 35-65-150-200. A large muslin bag was attached to the efflux of the last compartment in order to recover all of the sample. Ten grams (moisture-

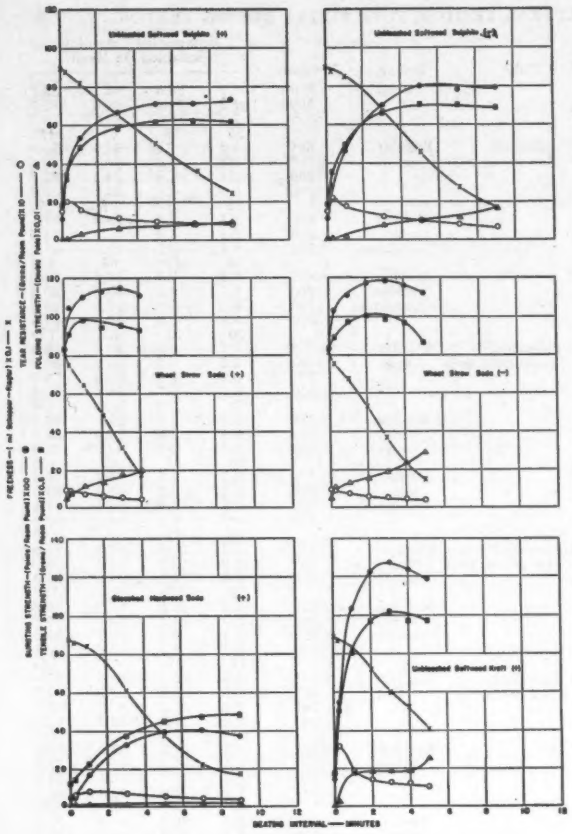

FIG. 5

Beating and strength characteristics of wood and agricultural residue pulps. Morden beater, single-batch runs. + Indicates weights in place; — indicates weights removed.

free basis) of pulp was placed in the first compartment and water was flowed through the compartments at the rate of 3 gallons per minute for 15 minutes. The stock was then removed from each compartment and filtered, dried, and weighed. Samples for fractionation were taken at the beginning of each beater run and at approximately 800, 700, 500, and 300 ml. Schopper-Riegler freeness, and freeness determinations were made at each sampling. A preliminary analysis of the data indicated that the best comparison of the results from the different types of beating and screen combinations used would be obtained on the basis of equal freeness. Therefore screen retention-freeness curves were set up, and the values found for 800, 700, 500, and 300 ml. are given in Table V. Where the freeness did not reach 300 ml. the value for that point was obtained by extrapolation.

The data in Table V show that, generally, under the same conditions of beating and at the same freeness, larger proportions of the long-fibered pulps are retained on the coarser screens, and that the longer the original fiber the greater is the amount retained. This is also shown in Fig. 7, which shows the amounts of fiber from the different pulps retained on the 20-, 35-, 65-, and 150-mesh screens, after beating to 500 ml. freeness in the sharp-tackle standard beater. The results with the sulphite and kraft wood pulps confirm the fact that the sharp-tackle beater did more cutting than the dulled beater.

The lower strength characteristics developed with the Morden beater (with the shaft weights in place) may be due, in part, to the greater degree of cutting of the fiber by this machine. The lower fiber retention, by the various screens, of the Morden-treated stock is shown in Table V for the kraft and sulphite wood pulps and for the flax shive and hemp hurd pulps, and is illustrated for kraft wood pulp in Fig. 7. The data for the flax shive and rice straw pulps indicate decreased cutting of the fiber by the Morden beater when the shaft weights were removed.

The reproducibility of fiber fractionation with this classifier was very good, as indicated by the data in Table V for bleached wood soda and wheat straw pulp. Using two different screen combinations, with one size (65-mesh) common to both, on pulps beaten under the same conditions to the same degree, the retention on this 65-mesh screen was practically the same for both combinations.

Conclusions

In general, these data on agricultural residue pulps, obtained with the same equipment and techniques used for the wood pulps, show that the farm residue pulps compare favorably with the wood pulps in all of the strength characteristics except tear resistance. The residue fibers are shorter than coniferous wood fibers but they are considerably smaller in diameter than the wood fibers. The farm residue pulps contain larger amounts of pentosans, and hence they hydrate more readily. These beating and strength develop-

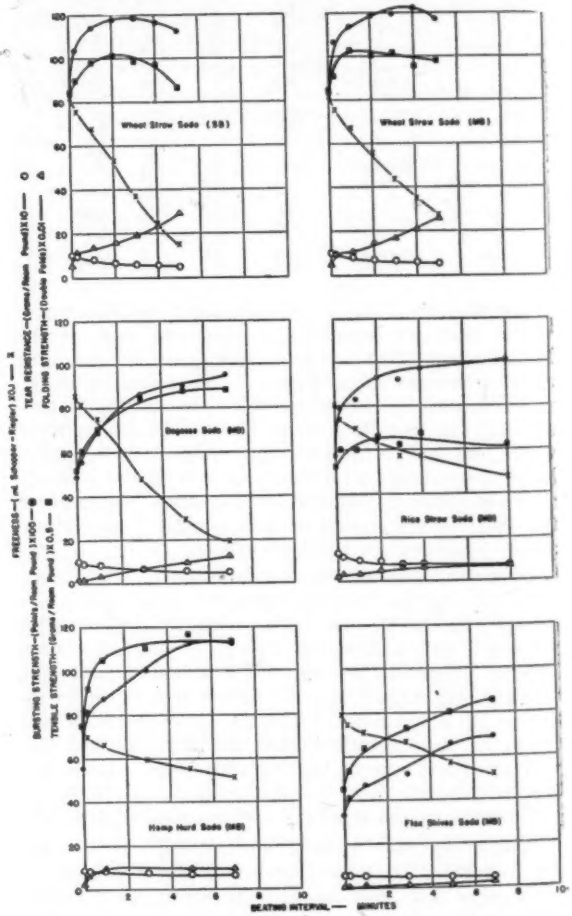

FIG. 6

Beating and strength characteristics of agricultural residue pulps. Morden beater, multi-batch runs, weights removed. One single-batch run on wheat straw soda pulp is included for comparison.

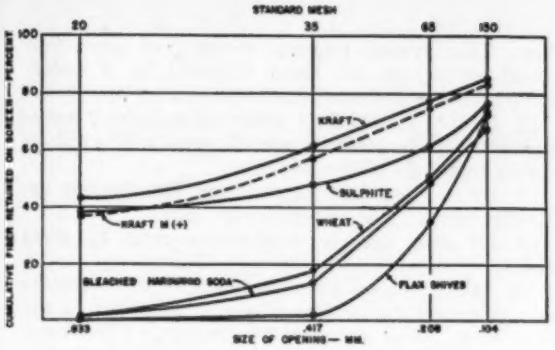

FIG. 7

Cumulative amounts of fiber (beaten to 500 ml. Schopper-Riegler freeness in the standard sharp beater) retained on 20-, 35-, 60-, and 150-mesh screens. The broken line curve is for wood kraft pulp beaten to the same degree in the Morden beater with the shaft weights in place.

ment characteristics of the agricultural residue pulps indicate that they would be desirable and useful for specialty products.

Acknowledgment

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B-F-D Plant Described at Northern Empire State Section Meeting

A meeting of the Northern Division of the TAPPI Empire State Section was held at the Pine Lodge on the Black River, March 13, 1947 at which R. E. Baker and J. E. Foote spoke on modern methods in sulphite pulp manufacture. Dr. Baker gave a very thorough and interesting description of the complete modern processes as installed at the B-F-D plant in Ogdensburg, from the acid plant, digesters, to the finished product. It was pointed out by Dr. Foote that the equipment involved was chosen by the B-F-D Company in order to set up as complete an automatic control cooking and acid making process as possible.

Those present included: Alan Alexander, A. Alcombrack, C. S. Booth, James Beckett, Jr., B. W. Barron, William P. Barnard, R. E. Baker, Wells Clark, E. Coughlin, J. J. Carroll Jr., Chas. M. Durkee, Walter Dempsey, C. T. Fogarty, J. Foote, Owen Fitzpatrick, E. A. Godfrey, C. N. Hager, E. P. Head, R. J. Hackett, D. A. Hunter, H. A. Horstman, C. Jewell, Martin Jaffe, R. D. Lewis, Will J. Lessard, E. A. Mahannah, Walter J. McNamara, O. C. Munger, M. D. Myers, Robert Magruder, D. C. Mather, L. C. Nevin, J. P. Ormsby, Richard Primo, Harold W. Peck, H. Remington, C. P. Richter, A. H. Sencor, R. M. Rice, J. R. Stebbins, J. H. Stitt, Alfred L. Trumpler, A. E. Thoisen, J. H. Treadwell, B. H. Treadwell, S. Mather Wright, Sheldon J. Young.

Ohio TAPPI Discusses Moisture Control

The March meeting of the Ohio Section of TAPPI was held at the Hotel Manchester, Middletown, Ohio, on Tuesday evening, March 11th, 1947, with 77 members attending. After a few remarks from K. P. Geohegan, national committeeman from the Ohio Section, the discussion of "Continuous Moisture Control" was opened by Steve Hluchan of the Beckett Paper Company.

Mr. Hluchan listed the general requirements for controlling moisture content as follows:

1. An adequate testing station and a good sampling technique. (Mosture content tests must be very carefully done.)
2. A good condensate removal system properly maintained.
3. An adequate steam supply free from excesssive super heat changes.
4. Automatic measuring and controlling equipment which is easily operated and maintained and capable to the required accuracy, and control limits without serious effect on the steam plant operation.

He pointed out that too often the instrument maker forgot about the steam plant and installed equipment which called for fluctuation of steam usage over such wide limits that it was impossible to operate the steam plant in an efficient manner. Likewise, it was frequently true that the paper maker did not understand the instrument and thus did not utilize it to its fullest extent. He pointed out that the best instruments could not operate properly if adequate testing equipment was not supplied to determine the actual moisture content of the paper from time to time so that proper calibration of the control equipment could be made.

He also emphasized that the condensate removal system must be properly installed and maintained. The best control system without good condensate removal is almost worthless. He also pointed out that excess superheat would also throw most instruments out of control. He considered 50° of super heat as excessive.

Mr. Hluchan next listed and discussed the factors effecting the moisture content in the sheet and those which hinder the operation of the various devices for controlling moisture content. These were as follows:

1. Steam pressure and quality variations. The importance of the amount of super heat was emphasized.
2. Condition of the condensate system. Air binding and water logging must be prevented. How nearly constant these factors can be held helps determine the efficiency of the control equipment.
3. Room ventilation and ambient humidity.
4. Machine speed changes. A good speed regulator prevents trouble from this source.
5. Changes in mechanical draw.
6. Changes in sheet formation or freeness of stock.
7. Changes in amount or kind of pulp furnish, filler, dye, size, or treating chemicals. Inert fillers have a serious effect especially on calibration. Changes in pH effect resistivity equipment particularly.
8. Nature and quantity of tubsizing or machine-coating. Machine coated paper is the most difficult on which to control moisture.
9. Changes in sheet caliper and density.
10. Changes in sheet temperature.
11. Changes in rate of water and moisture removal at fourdrinier section, presses, and uncon-

trolled drier sections. The moisture control usually operates on the last drier sections only.

12. Condition of drier felts. Drier felts cause moisture to equalize along the web.

13. Amount of static electricity being generated. (Electric methods only.)

Mr. Hluchan next listed the principal elements of a control system, namely:

1. Primary measuring or detecting element.
2. Amplifier and converter—to translate indicator variation into corrective power.
3. Controlled steam valve for adjusting temperature of the driers.

In his discussion of the requirements for a successful control system Mr. Hluchan listed the following:

1. Choice of equipment of sufficiently rapid response and sensitivity and well suited to the weight and grade of paper being made. He pointed out that in some equipment the response was instantaneous but others had a 5-10 minute lag. If the response is slow the sensitivity must be high.
2. Best possible installation of equipment. Too often the equipment is installed carelessly.
3. Check on drainage system and steam supply.
4. Trial operation on the equipment by a competent engineer understanding the equipment and process. He should make adjustments and tests, iron out any operating difficulties and learn limitations of the equipment.
5. Thorough explanation of the equipment, its operation, and its limitations to machine room personnel.
6. Installation of periodic inspection and maintenance service. A record should be kept of this inspection and any time any irregularities are reported the equipment should be examined at once to determine if repair is needed.
7. Installation of supervision policing of proper use and maintenance of equipment. Any instrument being used for quality control must be policed for best results.

Mr. Hluchan next discussed the various methods of measuring and controlling moisture content. These were as follows:

1. By steam header temperature changes. This consists of a thermal bulb in the main header which controls the steam valve.
2. By steam header pressure changes. This is not as good as control by temperature changes because a few degrees change in super heat has a big effect on the control. Also, instruments for measuring temperature are more precise than instruments for measuring pressure.
3. By a combination of steam header temperature and steam header pressure.
4. By sheet tension.
5. By header temperature changes reset by sheet tension. This introduces the idea of double control in which a secondary effect such as sheet tension is used to control the primary control method.
6. By pressure changes in pilot drier. The choice of the pilot drier is sometimes very critical. A poor selection causes hunting.
7. By Steam flow to pilot drier reset by sheet tension changes. This system introduces the idea of constant steam flow in the drier control system.
8. By humidity adjacent to the sheet through an electronic hygrometer.
9. By humidity adjacent to sheet through a measure of the change in conditioned-air flow across sheet. This system requires blowing of pre-conditioned air across the sheet followed by a collection of this air and continuous analysis of it.
10. By a.c., d.c., and r.f. electrical resistivity measurements. These methods are all greatly effected by certain materials in the paper.
11. By sheet surface temperature. Installations using this system are experimental only.
12. By sheet surface temperature reset by sheet tension.

Mr. Hluchan then discussed some of the commercial equipment for moisture which is in use in the Ohio Area. These included the Verigraph (Foxboro) which is an electronic hygrometer with thermal control; the Tenso-Temp (Mason-Neilan) which employs a tension roll and temperature control; the Brown Moist-o-graph which employs electrical resistance; the Stamm equipment which employs pressure control with the steam flow to a pilot drier as the automatic reset; the Stickle which employs tension and temperature control and the Pickles system. He pointed out that all systems have some kind of faults.

At the close of Mr. Hluchan's talk a few remarks were made by Mr. Roy Zellers of the Chillicothe Paper Company concerning the moisture control equipment in their mill. This included installations of the Pickle system, the verigraph, and the Stamm regulator. Mr. Zellers then introduced Mr. Fred Stamm, originator and designer of the Stamm system, who talked very briefly on moisture control. He pointed out that much of the trouble from overloading the power plant by large demands for steam could be prevented by proper selection of steam valves. He pointed out that v-port valves should be used and of a size no larger than required for the maximum steam flow. In connection with this it was pointed out by Mr. E. C. Hendrickson of the Mead Corporation that they had had trouble of this kind and had found that they were able to replace 6" valve with 2" valve after which their trouble disappeared.

During the open discussion remarks were made by men from the floor including Mr. Don Goodman of the Sorg Paper Company, Mr. Gordon Morgan of the Foxboro Company, and Mr. Harold Young of the Midwest Fulton Machine Company.

Those attending the meeting included the following:

H. C. Berkley, C. A. Ireton, R. R. Eliker, E. A. Greer, E. C. Hendrickson, C. N. Stupp, S. D. Dillon, J. C. Clouse, T. L. Stirling, C. L. Gebhart, R. C. Beckett, S. A. Staege, F. C. Closs, G. H. Suhs, D. S. Brown, C. F. Dermitt, H. Sinclair, P. M. Schaffrath, Leon Tyler, A. C. Groom, S. M. Bagler, L. B. Young, H. F. Topp, H. J. Borcher, H. N. Vander- P. S. Cade, B. Biven, J. Dow, B. M. Baxter, W. P. Baxter, H. Hixon, B. Bunch, H. A. Smith, P. E. Clark, D. L. Goodman, J. Gammon, N. S. Benzing, J. H. Moyer, D. Robbins, C. E. Ahlm, C. A. Osborne, W. J. Cassidy, Kon Matchuck, C. Moore, G. H. Young, H. F. Topp, H. J. Borcher, H. N. Vanderberg, Paul Petzold, F. L. Zellers, F. C. Stamm, A. Thurn, D. M. Yost, C. J. Carto, S. Hluchan, H. G. Morgan, C. E. Brandon, J. L. Vanderberg, H. S. Pedley, W. G. Magnuson, D. C. Rees, E. M. Brennan, L. E. Eberhardt, F. S. McGee, L. B. Barnes, W. F. Connolly. W. J. Carroll, C. A. Sorg, F. A. Root, R. Hazeltine, H. C. Leighton, E. Lum, A. H. Frazer, F. J. Brennan, R. D. MacCarron, P. C. Miller, N. Frisch.

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March 31-April 1-2, 1947—National Paper Trade Association, Annual Convention, The Waldorf-Astoria, New York City.

April 10-11, 1947—National Paperboard Association, Meeting, Seaview Country Club, Absecon, N. J.

May 18-21, 1947—National Paper Box Association, Annual Convention, Hotel Traymore, Atlantic City, N. J.

May 22-24, 1947—American Pulp and Paper Mill Superintendents Association, Annual Convention, Edgewater Beach Hotel, Chicago.

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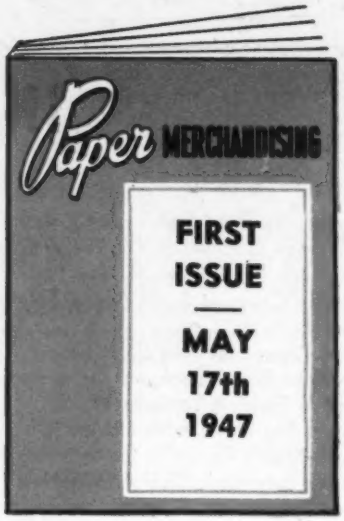

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